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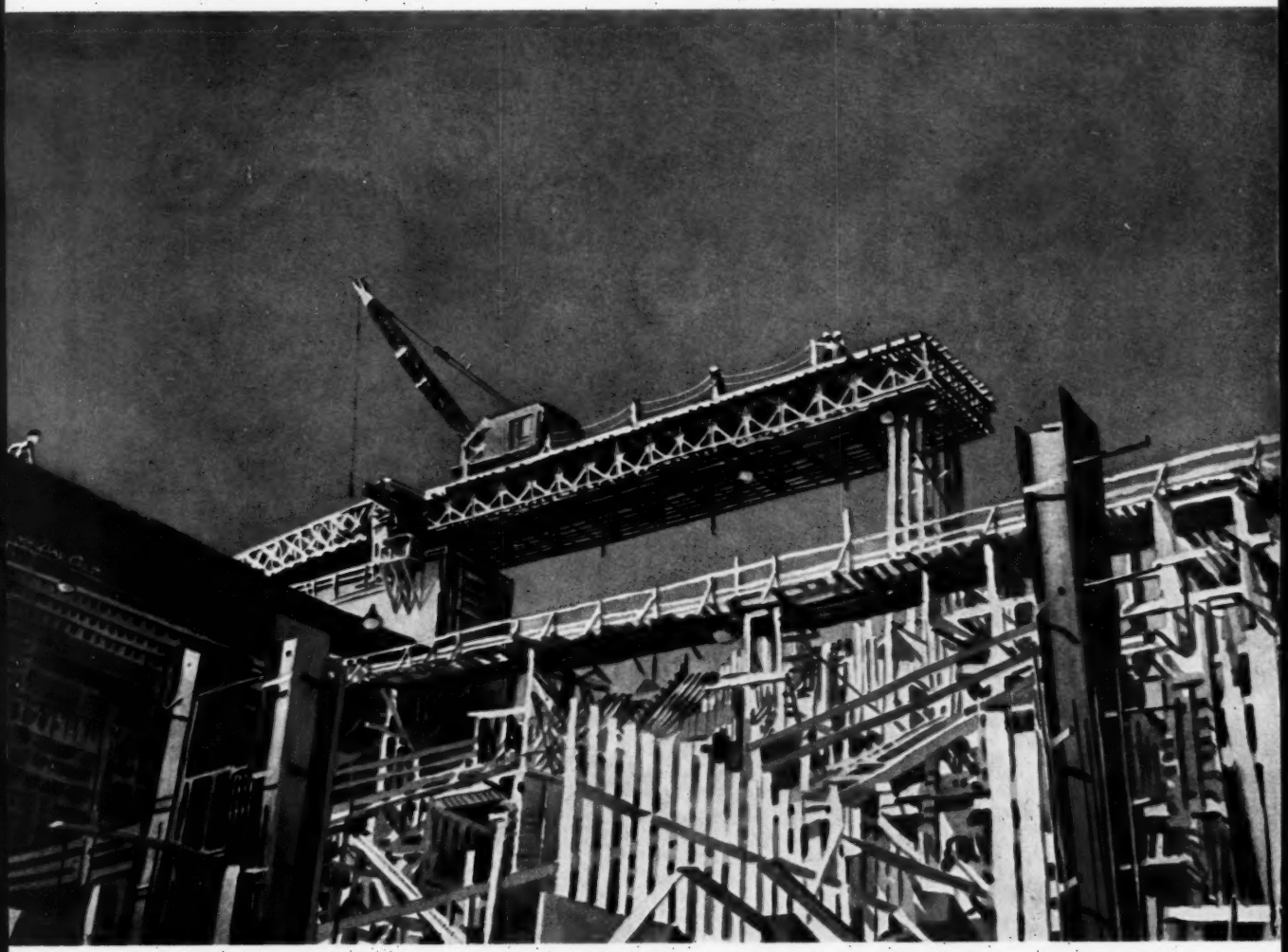
Construction Methods AND EQUIPMENT

A McGRAW-HILL PUBLICATION

SEPTEMBER, 1958



SPECIAL REPORT: Bailey Bridging

You can find Bailey units on almost every type of construction job from dams to house-moving. And ingenious contractors still are finding new and profitable ways to use this versatile tool.

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"POWERSTEEL"®

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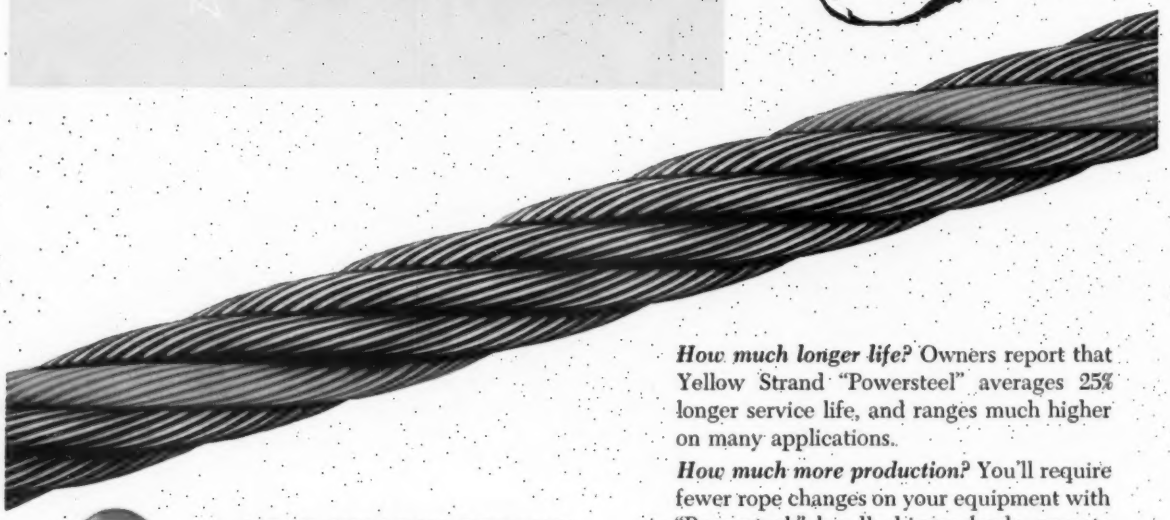

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B.F.Goodrich Rock Logger tires can be retreaded 3 times, ready-mix company reports

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Graystone Dispatcher George Meyer says, "B.F.Goodrich Rock Logger tires give the kind of traction we need in rough weather." Husky Rock Logger cleats dig in to give you maximum pulling power in forward or reverse. "They give rugged dependability around rough construction work," he adds.

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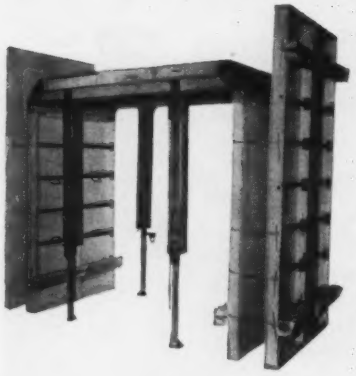
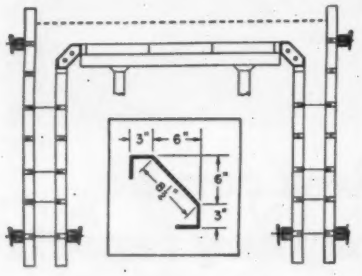


Symons Develops New Haunch Form for Culverts

Symons Safety Shores Used to Support Slab

Symons now has a new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts. This new section provides for a 3-inch face on the roof slab and



on the wall with a 45-degree-angle surface 8½ inches wide between wall and roof. No built-up forms or other special equipment is necessary.

Made of 11-gauge hot rolled steel this new section is available in 4, 6, and 8 foot lengths. It can be used with either metal frame or wood frame forms. Symons regular form hardware is used for securing the steel section to Symons standard forms. No special fittings are required.

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SEPTEMBER, 1958

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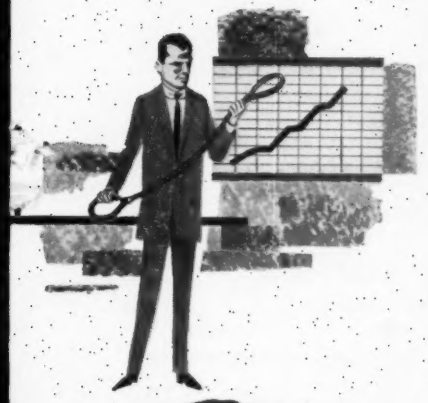

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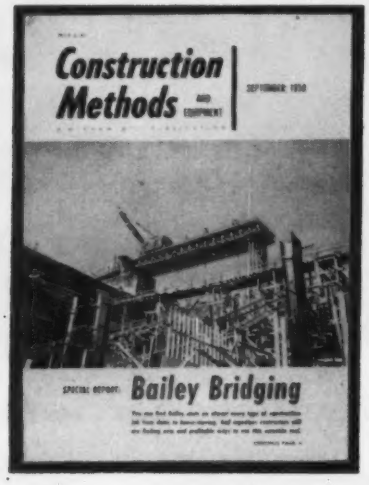

Special Report:

Bailey Bridging

72

ON THE COVER—A big crane, riding on a Bailey bridge, places formwork for the White Dog Dam project in northern Ontario. This is just one of the applications that contractors have discovered for versatile Bailey equipment, often regarded as strictly a military tool. The first of a two-part special report describes how Baileys are speeding road and bridge construction around the world.

Earthmovers Plug A Raging River 64

A big fleet of end and bottom dump trucks move 67,000 cu yd of material during a tense 21½-hr period to throw a dike across the Missouri River at the site of Oahe Dam.

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PLAN '59 FOR WHAT'S AHEAD

NEXT MONTH

The October issue of Construction Methods will explore the challenging future of the construction industry. This special report will present facts and figures to define the growing market for construction and help construction management plan now to meet the problems and take advantage of the opportunities that lie ahead . . . COMING IN OCTOBER

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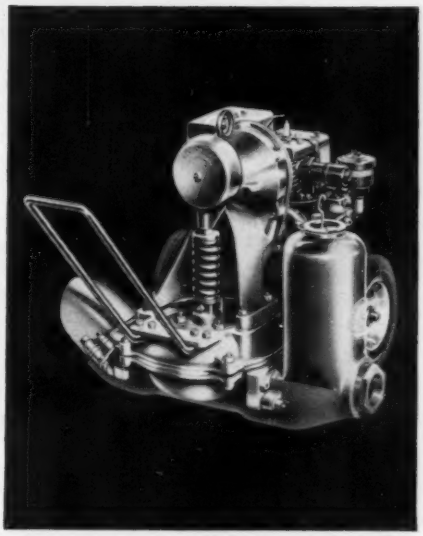

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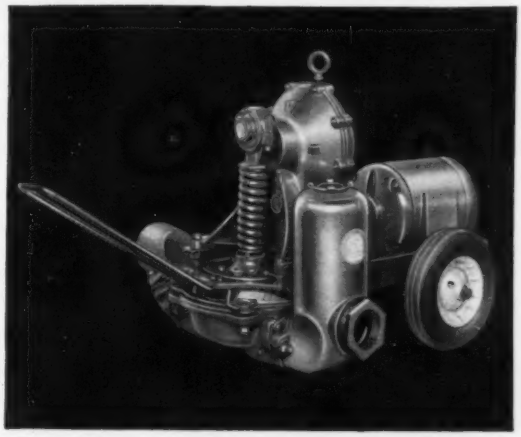

Gorman-Rupp 4" diaphragm pump with electric motor.

GORMAN-RUPP PUMPS — UNSURPASSED FOR PUMPING FAST

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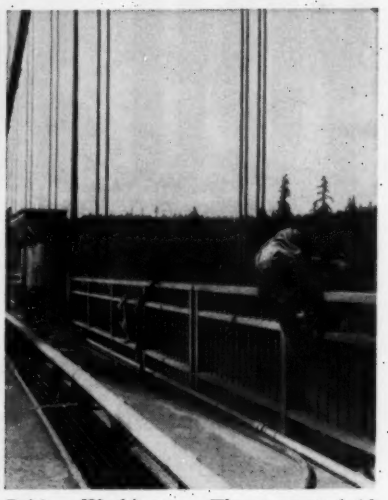
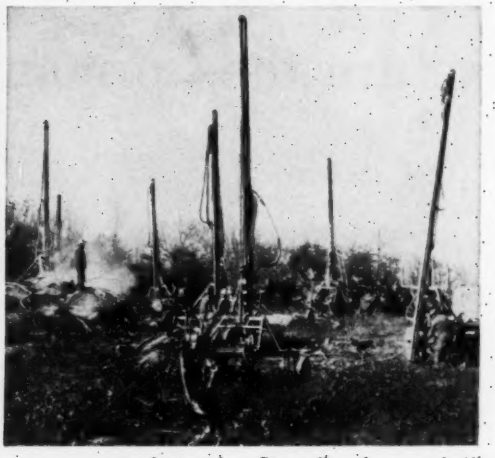


1565 CFM OF 110 LB. AIR FOR BRIDGE CLEANING: Runnels Industries used these 3 Jaeger rotary compressors (two 600's and a 365), connected to a 3″ air line, to supply twelve 5/16″ sandblasting nozzles spread out over a mile along Tacoma Narrows Bridge, Washington. They operated 10 hours a day at 110 lbs. pressure. Under such full loads, the 100-150 rpm slower speed of Jaeger compressors saves fuel and wear and tear on engines every day you work.



3 COST-SAVING IDEAS ON ONE JOB: This job, by Rambore, Inc., drilling specialists, was 280,000 cu. yds. of rock, mostly granite, in depths to 40′, on Massachusetts' Southeast Expressway. One of their good ideas was to hook up their drills and compressors through 1500′ of easily portable 5″ aluminum pipe. This saved frequent moving of compressors over rough terrain. Secondly, they used 4″ drills with 12-edged bits made to their special design for hard rock. Their third good idea was to power these 7 drills with 3 Jaeger Model 600 compressors, which deliver the same air at 1650 rpm that others produce at 1800 rpm, at a very substantial saving in fuel.

Using the same engine, Jaeger gives you 600 cfm of air at 150 rpm slower speed

You buy few items of equipment in which the superiority is so easily measured as in a Jaeger rotary compressor. For example: There are six 600 cfm rotary compressors on the market powered with the same GM 6-71 diesel engine. Five of these operate at 1800 rpm to produce rated volume. The sixth, the Jaeger, delivers the same volume at only 1650 rpm.

In one 8-hour shift this difference amounts to miles less engine piston travel, as much as 72,000 fewer compressor revolutions and a substantial saving of fuel. Jaeger 125, 250 and 365 cfm units, with 1700 rpm full load speed, are comparably efficient.

This explains why Jaeger users enjoy such low engine maintenance costs, and why many Jaeger rotaries have logged more than 8000 hours without a single vane replacement. Ask your Jaeger distributor for full data and demonstration . . . or send for Catalog.

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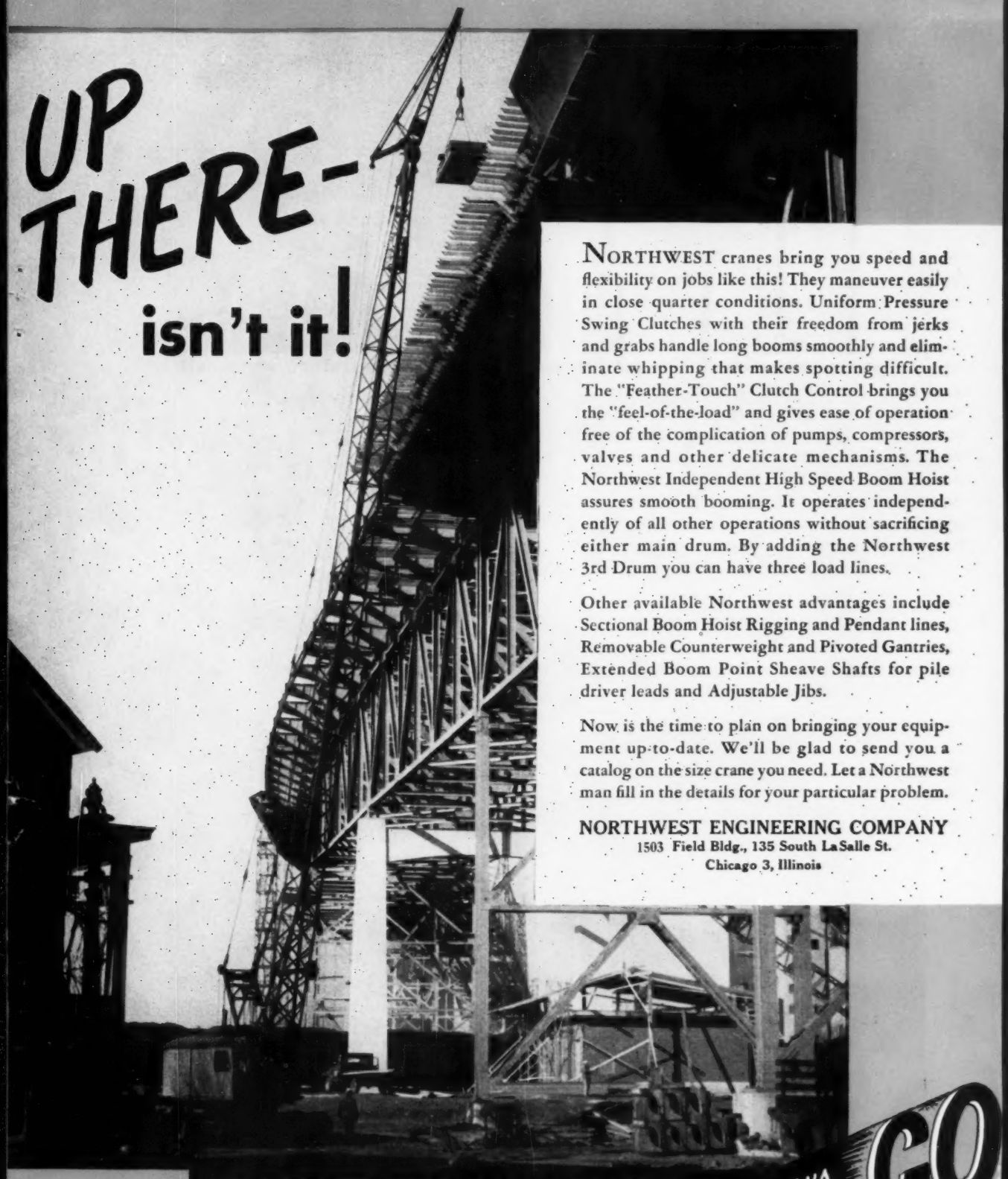

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NORTHWEST cranes bring you speed and flexibility on jobs like this! They maneuver easily in close quarter conditions. Uniform Pressure Swing Clutches with their freedom from jerks and grabs handle long booms smoothly and eliminate whipping that makes spotting difficult. The "Feather-Touch" Clutch Control brings you the "feel-of-the-load" and gives ease of operation free of the complication of pumps, compressors, valves and other delicate mechanisms. The Northwest Independent High Speed Boom Hoist assures smooth booming. It operates independently of all other operations without sacrificing either main drum. By adding the Northwest 3rd Drum you can have three load lines.

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Now is the time to plan on bringing your equipment up-to-date. We'll be glad to send you a catalog on the size crane you need. Let a Northwest man fill in the details for your particular problem.

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Construction News From Washington

Washington, D.C.
September, 1958

Roadbuilding for Five Years

Nationwide spending for new highways will increase from $6.2 billion this year to $8.1 billion in 1962, the Bureau of Public Roads forecasts. And roadbuilders can look forward to a rise in construction outlays from $5.1 billion to $6.9 billion in the same period, BPR says.

Overall expenditures by federal, state, and local governments will amount to $36.5 billion in the five years. Of this sum, nearly $30 billion will go to defray project construction costs. The remaining $6.5 billion will pay for right-of-way and engineering.

Construction spending is expected to step up from $5.1 billion this year to $5.7 and $5.8 billion in the two following years. It will jump to $6.3 billion in 1961 and to $6.9 billion in 1962.

Congress Must Act

Projections beyond 1962 won't have much value until Congress acts to clarify the future. Nearly 40% of the estimated highway expenditures for the five years will be covered by federal-aid funds. Federal-aid outlays are scheduled to rise from $1.8 billion this year to $3.4 billion in 1962.

Action by the next Congress is necessary to assure continued increase of highway construction beyond 1962, in line with the programs authorized by the 1956 and 1958 Highway Acts. State highway departments and industry organizations are readying all-out support for Congress in confirming federal-aid authorizations already made. To validate those sums and guarantee uninterrupted progress, Congress will have to repeat this year's action in removing pay-as-you-go limitations on federal-aid expenditures.

Money to Start New Jobs

Corps of Engineers and Bureau of Reclamation have money to start 64 new projects. This is only a small part of the $1 billion plus Congress voted the two agencies. Most of the total goes to continue construction on projects now under way.

Real significance of the new starts lies in the increased future construction volume they assure. Estimated cost of completing the 64 projects exceeds $800 million.

To contractors, however, the immediate concern is how speedily the Corps of Engineers and the Bureau of Reclamation can get the new jobs out for bids. This, in turn depends mainly on the willing-

ness of the President and his Budget Bureau to release the funds that Congress voted to initiate construction.

Despite his objection to assuming additional costs this year for future budgets to meet, Pres. Eisenhower could not refuse to sign the Public Works Appropriation Bill without putting federal water resources programs out of business. But he does retain executive power to hold back and slow down the spending of appropriated funds. It will be up to the White House to determine the timing of money releases for the new construction starts.

No Slow-Down on Urban Renewal

If Congress had enacted the omnibus housing bill, the Urban Renewal Administration would have had $400 million additional to parcel out to municipalities this year in grant commitments. That is just about the sum required to meet requests already on hand, without any allowance for an expected inflow of $200 million more during the current fiscal year.

To handle this work, the Urban Renewal Agency has $50 million in the till and another possible $100 million that Pres. Eisenhower can release at his discretion.

But lack of funds will not mean a cutback during the next 12 months in bid calls and contract awards for projects that are nearing the construction stage. These projects already have the federal grant commitments that enable local authorities to assemble, clear, and prepare project sites for sale or lease to redevelopers.

About 275 projects have advanced to this stage. On most of these projects construction will be under way in the next year or two. These projects will require more than $2 billion of construction.

$800 Million for Military Housing

Defense Department has the green light to go ahead with its original plans to sign contracts by next June 30 for 47,000 units of privately financed Capehart housing. With off-site utilities supplied by the military services, this housing calls for about $800 million of construction. It is split up into projects ranging from 50 units to 1,000 or more at military installations throughout the country.

Meany and Hutcheson

Watch the carpenters' Union. The McClellan committee gave carpenter boss Maurice Hutcheson a going over. Now AFL-CIO President George Meany is demanding that Hutcheson clear up unanswered questions on how he has handled union funds.

Meany won't crack down immediately. He doesn't want to throw the carpenters out of the AFL-CIO until there's no other choice. Expulsion would force them closer to the already expelled Teamsters Union, with unpredictable results.

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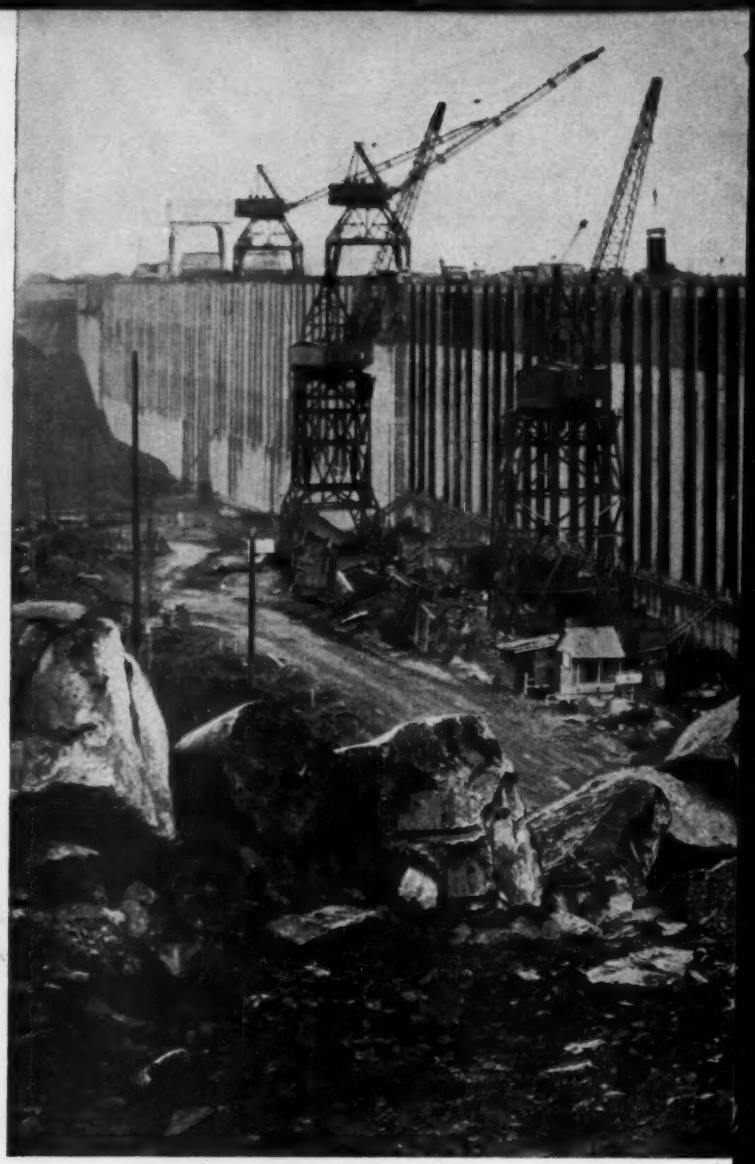


AN ESTIMATED 73% of the petroleum requirements on major St. Lawrence Seaway projects have been supplied by Texaco. Picture shows Bill Partisch (left), Texaco Lubrication Engineer, and Vic Pandolfi, Equipment Superintendent, discussing the Texaco Lube Plan, represented by the numbered barrels. In background, upstream side of Barnhart Island Power Dam and Robert E. Saunders Generating Station designed to generate 1,880,000 kilowatts. Construction of the 3,230-ft. wide, 167-ft. high concrete gravity dam involved excavation of more than 2,500,000 cu. yds. of earth and placing of approximately 2,000,000 cu. yds. of concrete. Dam is a joint project of the Power Authority of the State of New York and the Hydro-Electric Commission of Ontario. Contractors for both U. S. and Canadian sides used Texaco lubricants and fuels, the Canadian contractors being supplied through McColl-Frontenac Oil Co., Ltd., Montreal, a Texaco subsidiary.

NO MORE THAN SIX SERVE ON

Texaco Plan reduces needed lubes to no more than six

MASSENA, N. Y.—Barnhart Island Power Dam is the world's second largest hydro electric project (first: Grand Coulee).

A Texaco lubrication plan and the service that makes it work are credited by the contractor's Equipment Superintendent with playing a significant role in keeping the contractors' equipment in an operating condition.

"The Texaco Lube Plan has really helped," says Victor Pandolfi, Equipment Superintendent for Perini, Walsh, Morrison, Kiewit, Utah Companies, General Contractors. "We've used no more than six high quality lubricants *for the entire project* instead of 15 or 20. There's been less inventory. It's been simpler to service and protect the equipment. We've avoided mistakes in lubrication, and saved manhours and money."

Most Contractors Use Plan

The Barnhart Island Power Dam is just one of the St. Lawrence Seaway projects on which the Texaco Simplified Lubrication Plan has been used. It's estimated that 73% of the petroleum requirements for the Seaway have been supplied by Texaco, and that most maintenance programs have included the Lube Plan.

The Plan has been endorsed for the following reasons: proper lubricants are recommended; less storage needed, reduced confusion and misapplication; lower handling and maintenance costs; less time lost by equipment; fewer lubricating errors; time and money saved.

Developed on the Job, For the Job

The Texaco Simplified Lubrication Plan was developed

THE ST. LAWRENCE POWER DAM

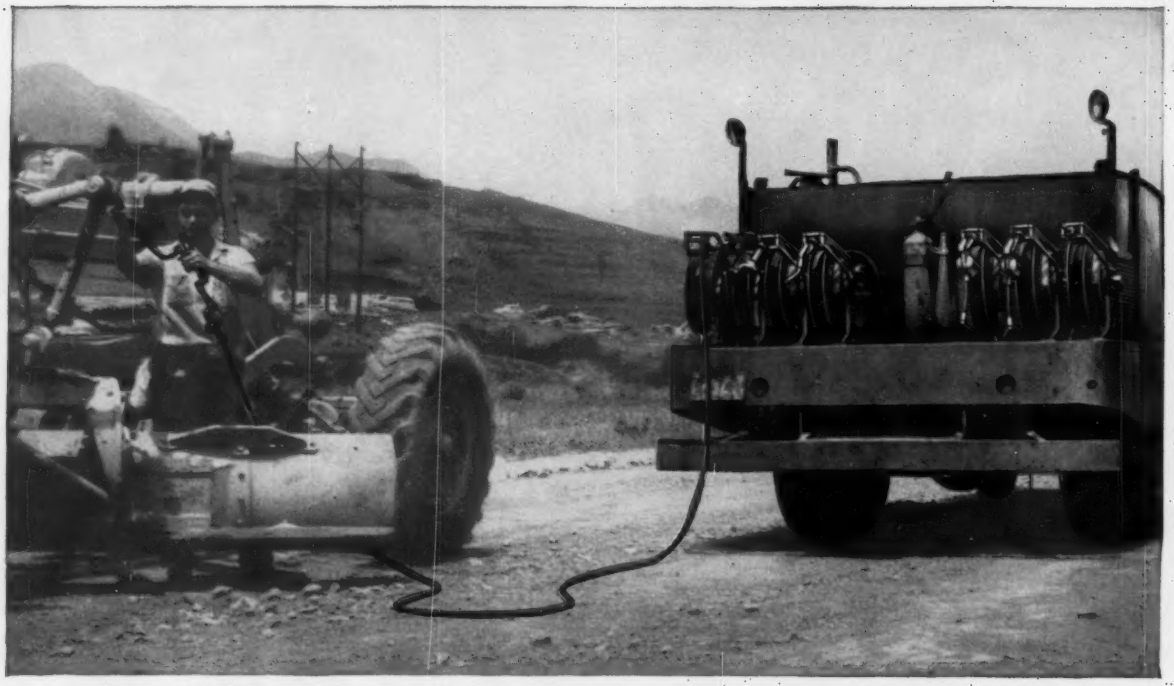
from on-the-job experience in all types of construction work. It's tailor-made for the work to be done. Lubricants may vary from job to job because each Plan is set up to meet the specific needs of a specific project. But regardless of the job, the basic fact remains that—*no more than six lubricants are needed to handle all major lubrication.*

Here are the six lubricants, illustrated above, used on the Barnhart Island project:
(1) For engines: *Texaco Ursa Oil Super Duty Special;* **(2)** for chassis, wheel bearing and general grease lubrication: *Texaco Marfak Multi-Purpose 2;* **(3)** for hydraulic units: *Texaco Regal Oil R&O;* **(4)** for transmissions and differentials: *Texaco Universal Gear Lubricant EP;* **(5)** for wire rope and open gears: *Texaco Crater;* **(6)** for enclosed reduction gears: *Texaco Gear Lube HD.*

Let a Texaco Lubrication Engineer work out a Simplified Lubrication Plan for your project. You'll save time, money and mistakes. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)



FOR LESS DOWN-TIME... GREATER OUTPUT
C. L. HUBNER COMPANY

lubricates busy rigs on the job

WITH ***Lincoln Lubrovans****

Lubrovan No. 1 purchased by C. L. Hubner, Denver contractor, from Plant Equipment Co. in Denver. Now Hubner services rigs practically on the run, follows equipment wherever job goes. Lubrication, formerly a problem, is now a daily routine.

PROTECT JOB PROFITS... CUT COST PER YARD

C. L. Hubner is one of many heavy construction contractors throughout the nation who depend on Lincoln Lubrovans to keep their equipment rolling. These roving lube departments guard against breakdowns, cut cost per yard and extend working-life of the equipment.

Portable Lubrovans provide dependable maintenance and keep equipment on the job for maximum output and greater profit per yard. They're available in standard groups or can be custom-planned from easy-to-assemble components, to match your specific type of operation.

We'll be happy to demonstrate *on your job* how a Lincoln Lubrovan can protect and increase your profits. Call your local Lincoln Distributor.

*Trade Name Registered

Lincoln Lubrication Equipment is available through leading distributors—with coast-to-coast sales and service

Lincoln

LINCOLN ENGINEERING COMPANY
Division of the McNeil Machine & Engineering Co.
5702-19 Natural Bridge Avenue • St. Louis 20, Missouri

Geared by FULLER...

...Insley Crane Carrier speeds construction at Walt Disney Studio

Donald Duck may be up in the air about goings-on at the new sound stage at Walt Disney Studios in Burbank, California. But the rest of the Disney family is enthusiastic about progress on the ultra-modern, super-equipped stage.

One reason for their enthusiasm is the speedy construction of the building, which is scheduled for work on Disney's newest production, a pixillated Irish fantasy named "Darby O'Gill and the Little People."

Rapid progress on the new sound stage is largely due to the speed and flexibility of Insley cranes used on the construction project, all of which feature Fuller main and auxiliary Transmissions. Built by Insley Manufacturing Corporation, Indianapolis, all Insley cranes, like the 35-ton model shown here, are mounted on Maxi crane carriers.

Because of the nature and variety of work these machines are expected to perform, Maxi specifies only dependable, heavy-duty transmissions for each model. Standard equipment on 35, 40 and 45 ton models includes Fuller 4-A-86 main Transmissions and Fuller 3-C-92 auxiliary Transmissions. Designed to help the operator handle heavy loads over widely varying conditions, the Fuller 4-A-86 and 3-C-92 Transmissions have proved ideal for all types of crane work.

FULLER

TRANSMISSIONS

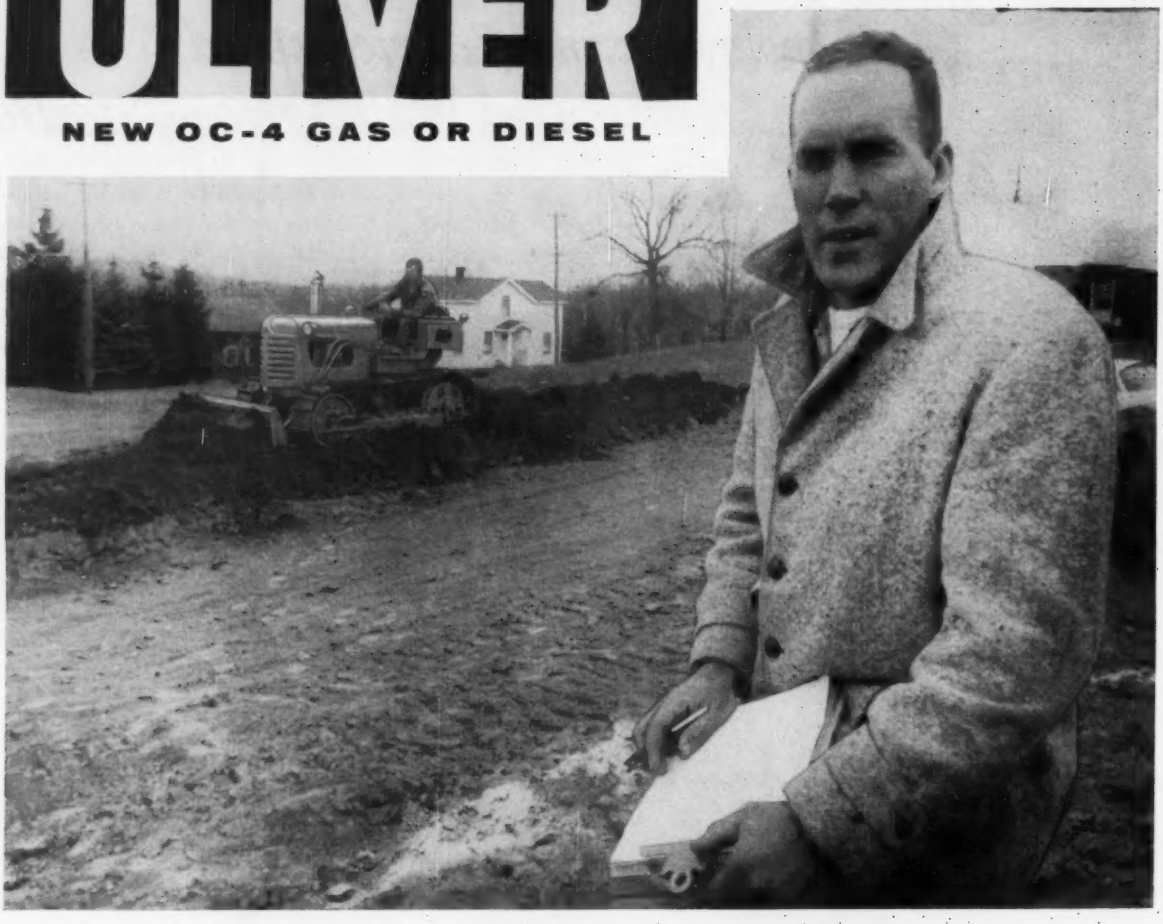
FULLER MANUFACTURING CO. Transmission Division • Kalamazoo, Mich.
Subsidiary, Eaton Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.

©WALT DISNEY PRODUCTIONS

OLIVER

NEW OC-4 GAS OR DIESEL



Pier Kooistra says,

"The new Oliver OC-4 costs only $3 a day to operate* and cuts working time two-thirds!"

Handling a variety of work which includes excavating, paving, landscaping, septic tank installation, etc., Pier Kooistra of Preakness-Wayne, New Jersey, has experience with plenty of tractors. Visited on this job where he is stripping topsoil preparatory to excavating for a basement, he said, "The new OC-4 is just the machine for me. On similar jobs I've hired larger machines with costs of about $40 a day more than I pay to use my own OC-4."

What's more, he states that the new OC-4 has more traction-maneuvering on soft ground than any other machine he has ever seen or operated.

He concluded, "I'd much rather own five OC-4's than two or three larger machines because I'll make more money with less operating capital." There's a thought worth examining further. Ask your Oliver distributor. He can give you the arithmetic that will save you money.

**Fuel cost, of course.*

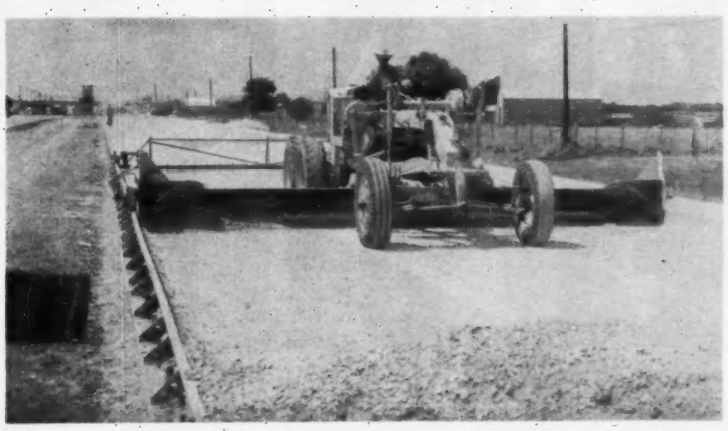
Oliver OC-4—a compact, powerful machine. "Here's the trailer I use to haul the OC-4 from job to job. For a heavier machine it would cost me at least $1000 more for a used truck or $3000 for a new truck—plus everything else that costs more," says Mr. Kooistra. Get the facts about the new OC-4 before you buy.

THE OLIVER CORPORATION

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

Job Talk...

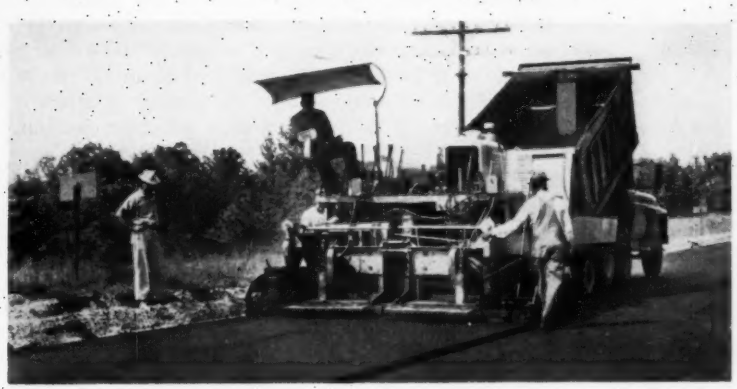


Long Blade Finishes Subgrade

E. B. Darby Construction Co., of Pharr, Tex., fitted a Caterpillar motor grader with a 28-ft-long blade for finish grading a dual-lane highway south of Houston.

Darby welded two 12-ft-long mouldboards together and added 2-ft extensions on each end to make the long blade. Adjustable wheels at each end of the blade run along the top of paving forms. To prevent disturbance to finished subgrade when backing up, the operator can pick up the blade by raising the grader circle.

The rig follows another grader with conventional blade that does the rough grading.



Rubber-Tired Pavers Roll Fast

Two Blaw Knox rubber-tired bituminous pavers help Warren Brothers Road Co., of Cambridge, Mass., make up for lost time on a 15-mi widening and resurfacing job near Huntingdon, Tenn. Inclement weather delayed work for several weeks, but now the job is 50% ahead of schedule.

Each Express paver has laid up to 142½ tons of bituminous material per hour. They make 12-ft-wide passes with a 3½-in.-thick binder topped by a 1¼-in. surface course. Automatic controls on the new models boost output.

Job superintendent Ray Duckworth credits the pavers with laying up to 20% more than similar crawler type machines. He believes the long 9-ft wheelbase of the new pavers improves quality of the roadway by reducing roller action. And he likes the way the rubber-tired units move quickly around the job.

Warren Brothers also use the pavers to place sand insulation and asphalt courses in 10-in.-deep, 3-ft wide trenches on either side of the roadway.

continued on page 22

STEEL-SHEET

PILING

get the exact job lengths and exact job sections on the Foster Rental Plan

To get real help on your piling work, and for the fastest dependable service, count on the Foster Rental Plan to save you money. It's the one sure way to get the exact sections and the exact lengths of Steel-Sheet Piling to meet your job requirements. Your only cost is a low, fixed expense chargeable to work in progress . . . no need to tie up capital in inventory.

We'll deliver your complete piling needs immediately, *anywhere* in the country, from our nationwide warehouse and field stocks—"Faster-from-Foster".

For help in ordering, write or call the Foster office nearest you for free Piling Wall Chart No. CM-9.

SINCE 1901

COMPLETE CONTRACTOR SERVICE

PILING • PIPE • RAIL • HIGHWAY PRODUCTS

L. B. FOSTER CO.

PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

IMPORTANT NE STEEL JOIST

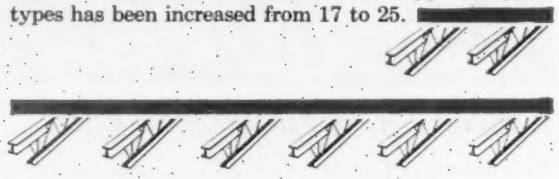
1 **DESIGN** Architects and engineers now are offered all types of SJI Approved open web steel joists, based upon 20,000 psi working stress. Open web steel joists approved by the Institute are thus in balance with all other steel used in structures. Greater economy and a more efficient use of steel results.

2 **COMBINED SPECIFICATIONS**

Specifications and load tables for all types of open web steel joists are combined in one handy reference for the designing architect and engineer. "S" series and "L" series joists uniformly designed are covered in this one over-all standard specification.

3 **NEW SIMPLIFIED MARKING FOR OPEN WEB STEEL JOISTS** To simplify the designation and type mark of steel joists of all types and spans, a uniform system of marking has been adopted. The depth and series identification is incorporated in one type mark to give the designer a uniform system for identification. For example, an "S" series joist, formerly identified as type SJ102 will now be known as 10S2, or a 10" deep joist of the "S" series and a #2 chord section. A joist identified as 24L06 is a 24" deep, "L" series joist of a #6 chord section.

4 **EIGHT ADDITIONAL TYPES** To provide greater flexibility and a more exact application of open web steel joists for given structural loads, the "S" series of Steel Joist Institute Approved joist types has been increased from 17 to 25.



STEEL JOIST INSTITUTE

1346 CONNECTICUT AVE., N. W. • WASHINGTON 6, D. C.

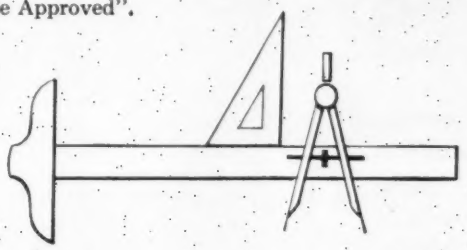
Steel joists of the designations adopted by the Steel Joist Institute and manufactured by the following companies have been investigated and approved by the Steel Joist Institute:

AMERICAN BRIDGE DIVISION
United States Steel Corporation
ARBUTUS STEEL COMPANY
BETHLEHEM STEEL COMPANY
BUILDERS STRUCTURAL STEEL CORP.
CECO STEEL PRODUCTS CORP.
COLORADO BUILDERS SUPPLY CO.
CONCRETE STEEL COMPANY
JOHN HANCOCK, JR., INCORPORATED
LACLEDE STEEL COMPANY
MACOMBER INCORPORATED
ROBBERSON STEEL COMPANY
JOS. T. RYERSON & SON, INC.
SHEFFIELD DIVISION
Armco Steel Corporation
SOUTHWEST STEEL PRODUCTS
TRUSCON STEEL DIVISION
Republic Steel Corporation
VIRGINIA STEEL COMPANY

WS FROM THE INSTITUTE

5 ENGINEERING DESIGN CHECK . . . "L" SERIES

To assure designers and specifiers of "L" series open web steel joists of proper uniform design properties, an engineering design check on such joists has been developed by the Steel Joist Institute and will be required before a manufacturer is permitted to indicate his product as "Steel Joist Institute Approved".



6 QUALITY VERIFICATION PROGRAM . . . "S" SERIES

A Quality Verification Program on all Steel Joist Institute Approved "S" series open web steel joists assures designers and code authorities that these structural members have not only been checked for design and load bearing ability but are subject to a continuing program of inspection by an independent laboratory at the Steel Joist Institute member company plants, to provide assurance that actual fabrication and production conditions are maintained to SJI standards.

7 NEW LOAD AND SPACING TABLES

Although the SJI Approved open web steel joists to be manufactured under the new SJI Standard will not be available from member companies before January 1, 1959, a new comprehensive load and spacing table is offered the architects and engineers for use as of October 1, 1958. This will permit inclusion of the construction economies of the new balanced design steel joists in many structures now in the planning stage.

STEEL JOIST INSTITUTE APPROVED SJI ©

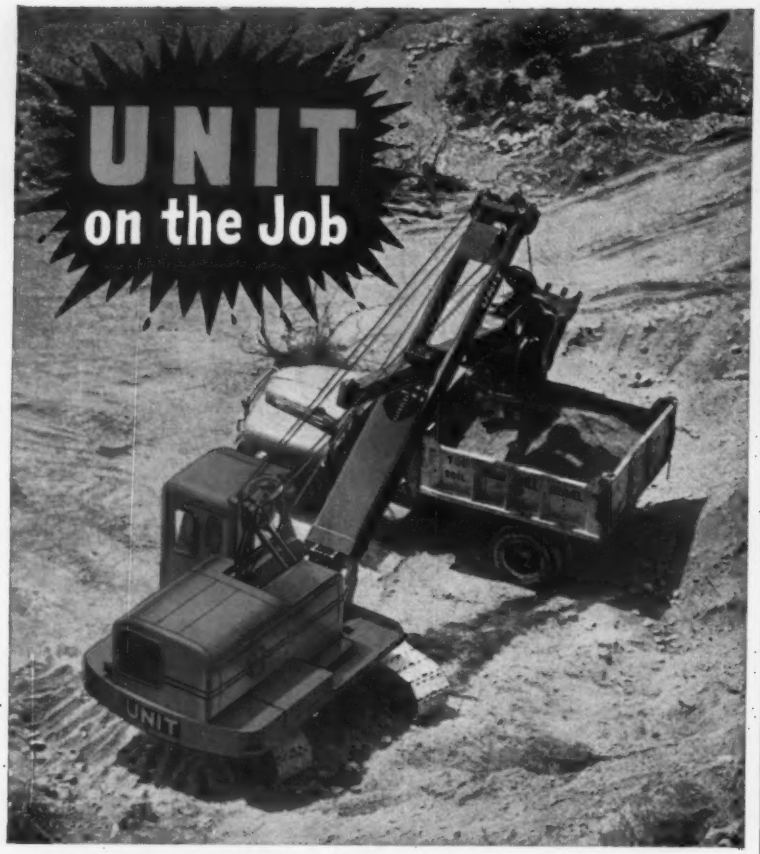
FREE! *Write for new standard specifications and load tables.*

See our insert in Sweet's Architectural File 2c/St

STEEL JOIST INSTITUTE
Room 715
DuPont Circle Bldg.
Washington 6, D. C.

☐ Please send me a copy of your new Standard Specifications and Load Tables.

Name_____
Company_____
Address_____
City_____ Zone____ State_____



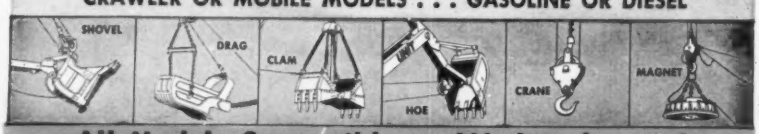
SWING SPEED makes PAY LOADS!

Here's a UNIT ½ Yard Shovel doing a PRODUCTION DIGGING JOB in a gravel pit. UNIT owners like the ease of operation and the FULL VISION CAB for complete visibility. They also like the sturdy construction and the many mechanical features, plus the ECONOMICAL PERFORMANCE and LOW UP-KEEP which all add up to EARNING POWER. Why not investigate what UNIT can do for you — on YOUR next excavating and material handling job?

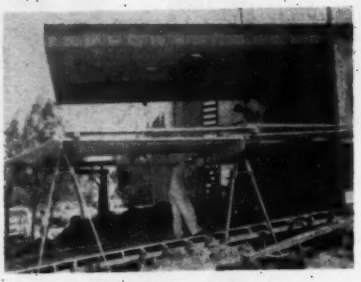
SEE FOR YOURSELF: *Let us send you our novel TV Brochure. It illustrates the complete UNIT line.*

UNIT CRANE & SHOVEL CORPORATION
6305 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

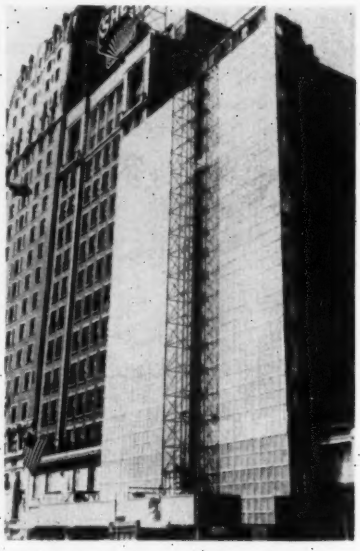


All Models Convertible to ALL Attachments!



Jacks Level Scaffolding

Adjustable scaffold jacks support a work platform for plasterers underneath a ramp canopy on the Raskin Building in El Segundo, Calif. Los Angeles plastering contractor Mowery-Thomas, Inc., had to set up the scaffolding on soft, uneven fill before concrete for the ramp itself was poured. The contractor made a level platform on top of the fill with Superior Scaffold-Jiffy Jacks.



Plastic Film Covers Building

A thin sheet of Visqueen polyethylene film stretched tautly over the facade of the 10-story International Business Machine office building in downtown Chicago serves as a light but tough temporary covering. Contractor B. W. Handler of Chicago is replacing the old masonry face of the building with a curtain wall of aluminum and glass. Handler put up the transparent, waterproof film to protect passers-by from falling objects and to permit his crews to work in any weather.

FRAM FILTERS *cut our down-time in half!*

"They're really doing a good job," reports Victor Holzinger, Master Mechanic of The Gaskill Construction Co. of Riverton, N. J.

"We used to put about 3000 hours on our six earth movers before they were pulled into the shop for an engine overhaul. Now, since we installed FRAM Air Filters, about a year ago, we're logging over 6000 hours. What's more, we've been able to chop about half an hour off our daily maintenance, too. We're very well satisfied with FRAM Air Filters... and are equipping all of our off-the-highway vehicles with FRAM Filters."

Wherever the going is rough, tough and dirty . . . FRAM Oil and Air Filters fill the bill. Engines work longer and harder, need less maintenance and fewer overhauls when you protect them with FRAM Filters.

FREE SURVEY! If you would like a FRAM Field Engineer to survey your fleet, use this coupon.

FRAM Corporation
Fleet Sales Division
Providence 16, Rhode Island.

Please have representative call and give complete details on Free FRAM Fleet Filter Survey.

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NOW! NEW JOB-MATCHED

460 UTILITY

240 UTILITY

INTERNATIONAL CUB® LO-BOY®
12.8 HP

INTERNATIONAL 240 UTILITY
38.5 HP

INTERNATIONAL 340 UTILITY
45.0 HP

INTERNATIONAL® TRACTORS

. . . size and stamina to match your every power need!

340 UTILITY

Step into a NEW WORLD of UTILITY POWER!

Now! The widest array of power on wheels ever offered industrial and commercial users! New International tractors open a whole new world of more efficient utility power for loading, trenching, lifting, hauling . . . for saving time and cutting costs on the widest range of work!

Power *PLUS* brawn! Each new International weighs in at the heavyweight end of its respective power class—sizes from 12.8 to 72.5 bare engine horsepower. This built-in brawn assures *strength*, *stamina*, and *dependability* that cuts down-time to a bare minimum . . . keeps production up! **All-new features include:**

New 3-point hitch with precision Tel-A-Depth control . . . ultra-smooth six-cylinder engines for heavy-duty Internationals, 61 and 72.5 engine hp . . . Fast Reverser to speed all shuttle-type operations . . . higher-capacity built-in hydraulics . . . heavy-duty power steering . . . years ahead operating comfort and maneuverability. These, plus exclusive IH-developed Torque Amplifier drive and Fast-Hitch, let you literally "tailor" a new International to your exact power and equipment needs.

There's a dealer near you. See him today for on-the-job *proof* of bonus *capacity* and *dependability* in a new International tractor. For new, illustrated catalog, write International Harvester Co., Dept. CME-9, P. O. Box 7333, Chicago 80, Illinois.

INTERNATIONAL 460 UTILITY
61.0 HP

INTERNATIONAL 560
72.5 HP

SEE YOUR
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International Harvester Products *pay for themselves in use* —Farm Tractors and Equipment . . . Twine . . . Commercial Wheel Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois

US RUBBER CONVEYOR BELTS

Higher speeds, greater loads, longer life —with fewer belt plies!

The unusual thing about this self-propelled loader is the fact that it is equipped with a *4-ply* belt which is turning out a more satisfactory performance than the *5-ply* belt it replaced. This 4-ply belt is a U. S. Rubber Giant® (style EN), 54' long, and is doing such a good job that the operator is very well satisfied with its excellent performance.

The service is rugged—handling sand and gravel at speeds up to 700 fpm over small pulleys, under severe weather conditions, sun and ozone.

These belts—like all "U.S." belting—are engineered to always assure you of cost-saving performance and durability. Belts to service your requirement are available, right from stock, at your local "U. S." Distributor.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

US RUBBER **Mechanical Goods Division**

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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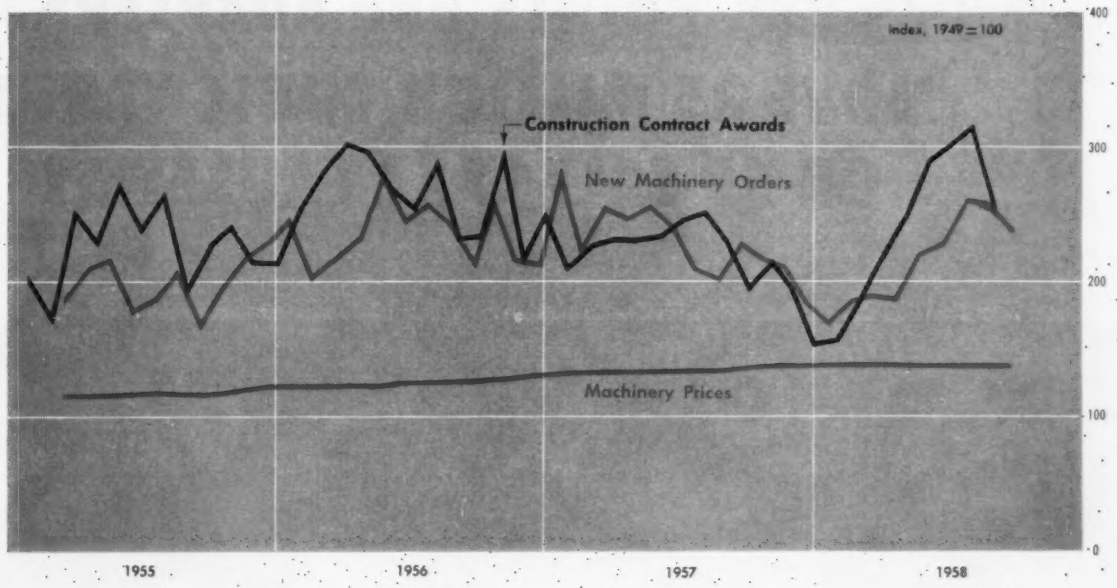
Trends in the Machinery Market



Price Index

	JULY 1958	MONTH AGO	YEAR AGO	% CHANGE 1957-1958
All Types of Equipment	165.5	165.5	157.9	+4.8
Cranes; Draglines, Shovels	**163.8**	**163.8**	**160.2**	**+2.2**
Shovel, ½ cu yd	154.0	154.0	150.9	+2.1
Shovel, cu yd	167.7	167.7	162.9	+2.9
Shovel, 1-1½ cu yd	178.4	178.4	172.4	+3.5
Shovel, 2-2½ cu yd	154.4	154.4	147.1	+5.0
Shovel, 3-3½ cu yd	162.7	162.7	158.3	+2.8
Shovel, 6 cu yd	180.1	180.1	176.5	+2.0
Crane, truck mounted	164.2	164.2	162.1	+1.3
Crane, tractor mounted	135.1	135.1	131.7	+2.6
Bucket, clam shell	152.7	152.7	152.7	0
Bucket, dragline	180.8	180.8	180.8	0
Scrapers and Graders	**158.8**	**158.8**	**150.1**	**+5.8**
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	151.3	151.3	143.9	+5.1
Scraper, 2 Wheel, 14-18 cu yd (a)	122.7	122.7	113.6	+8.0
Grader, heavy duty	164.0	164.0	154.9	+5.9
Grader, light & medium	161.2	161.2	152.2	+5.9
Tractors (non-farm, incl industrial)	**180.5**	**180.5**	**169.3**	**+6.6**
Wheel-type, off highway (a)	128.4	128.4	118.6	+8.3
Crawler-type, 45-60 dph	182.6	182.6	172.3	+6.0
60-80 dph	185.8	185.8	176.6	+7.6
80-120 dph	186.7	186.7	172.3	+8.4
120 and up dhp	191.8	191.8	178.3	+7.6
Machinery, Tractor Mounted	**161.7**	**161.7**	**155.8**	**+1.8**
Dozer, cable controlled	151.6	151.6	149.0	+1.8
Dozer, hydraulic controlled	177.3	177.3	170.6	+3.9
Cable power control unit	147.9	147.9	139.9	+5.7
Loader, shovel type	153.9	153.9	148.6	+3.6
Specialized Machinery	**150.7**	**150.7**	**144.6**	**+4.2**
Ditcher	154.1	154.1	151.8	+1.5
Roller, tandem	193.2	193.2	181.7	+6.3
Roller, 3 wheel	161.6	161.6	154.8	+4.4
Ripper and rooter	143.3	143.3	138.1	+3.8
Dewatering pump, 10 M gph	111.7	111.7	108.1	+3.3
Dewatering pump, 90 M gph	144.3	144.3	133.3	+8.3
Portable Air Compressors	**159.1**	**159.1**	**146.2**	**+8.8**
Contractor's Air Tools	**164.5**	**164.5**	**153.6**	**+7.1**
Mixers, Pavers, Spreaders	**149.0**	**149.0**	**143.1**	**+4.1**
Mixer, portable, 11 cu ft	160.1	160.1	151.7	+5.5
Mixer, portable, 16 cu ft	163.1	163.7	153.6	+6.6
Mixer, truck, 6 cu yd	127.3	127.3	122.1	+4.3
Mixer, paving, 34 cu ft	185.2	185.2	176.2	+5.1
Concrete finisher & spreader	173.0	173.0	171.1	+1.1
Bituminous distributor	122.4	122.4	115.9	+5.6
Bituminous spreader	160.3	160.3	160.3	0
Bituminous paver	153.0	153.0	149.8	+2.1
Off-Highway Trucks, Wagons (b)	**99.9**	**99.0**	—	—
Contractors off highway truck (b)	99.9	99.0	—	—
Trailer dump wagon (b)	100.0	100.0*	—	—

• a January, 1955=100 • b January, 1958=100 *Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49=100

Machinery Orders Set July Record

New orders for construction machinery dropped in July from the level of the previous month but still were high enough to set a new July record. They were 4% higher than in July, 1957, the previous record high for the month.

The McGraw-Hill Department of Economics Orders Index dipped to 250 in July (based on 1949 as 100). In June the index stood at 273.

A sharp cutback in federal contracts and a moderate seasonal decline in state and local public works pulled total contract awards in August below the booming July rate. But contract awards during the month were more than 12% higher than in August, 1957, and were the second largest ever recorded for August by Construction Methods.

A reduced volume of "Capehart" military housing projects was chiefly responsible for the drop in federal awards. Total federal awards in August were less than one-third the July total.

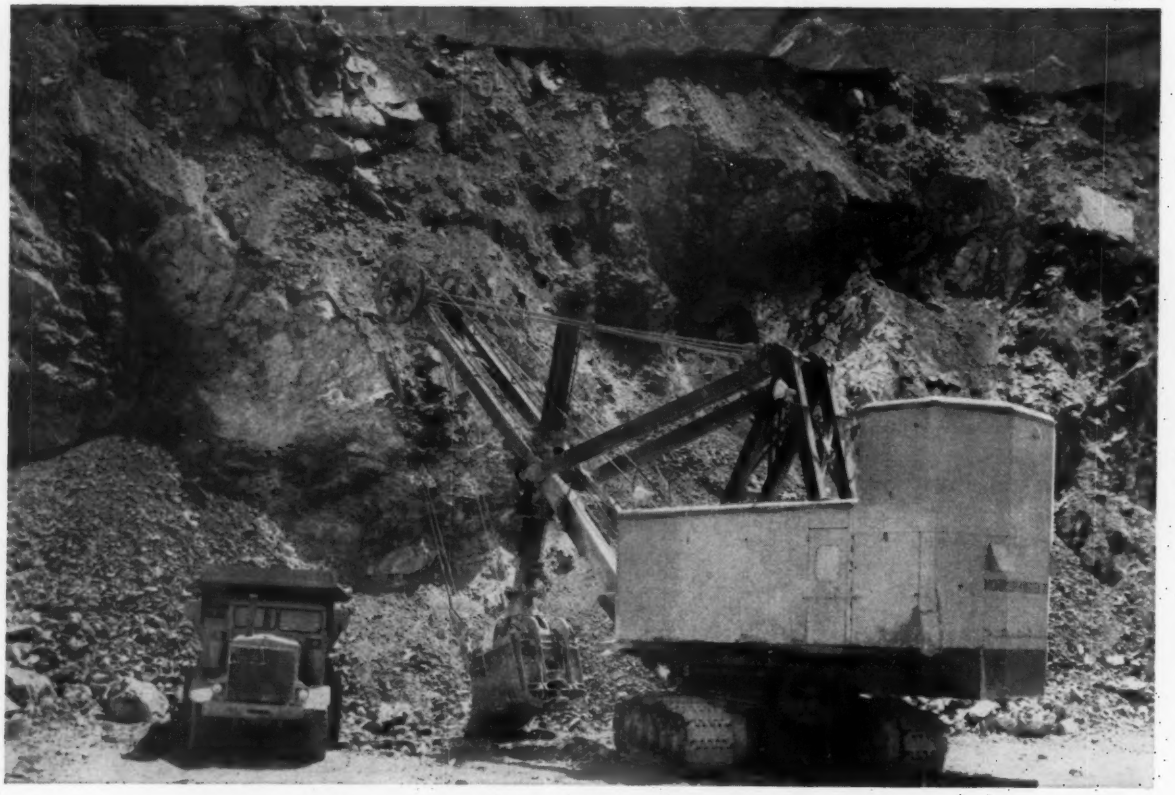
Highway contracts set a new high in August, averaging $92 million per week. That is 38% more than in August, 1957. Private awards scored a second consecutive monthly rise.

Prices Hold Steady

Prices of construction machinery in July were stable for the eighth straight month. The Bureau of Labor Statistics index of manufacturers' prices held at the June mark of 165.5 (based on 1947-49 as 100). June prices were 4.8% higher than a year ago.

Rental rates in '58 are generally higher than in '57, though rates for some machines are down, a compilation by Associated Equipment Distributors, Chicago, Ill., shows.

ESCO POINTS and ADAPTERS MOVE 35 MILLION CUBIC YARDS ON SP SALT LAKE CAUSEWAY



ESCO points and wearcap adapters on M-K's dippers are quarrying the 35 million cubic yards of fill material for the mammoth causeway.

EVERY *ESCO* POINT IS BRINELL TESTED TO ASSURE THE MAXIMUM DEGREE OF ABRASION-RESISTANCE HARDNESS AND LONG LIFE

SEVERE DIGGING CONDITIONS EXPERIENCED

Shovel operators and mechanics, veterans in all types of rock excavation, say they have never experienced such severe digging conditions as the high silica content quartz being quarried by Morrison-Knudsen Company for the 13-mile long Great Salt Lake railroad crossing of the Southern Pacific Railroad.

Increased point wear caused by this highly abrasive material makes the quick-change feature of *ESCO* points an important factor in keeping downtime to an absolute minimum. Easy-to-change *ESCO* points save at least half the time required in replacing bolt-on teeth.

ESCO Cast 12M Points and Adapters Cut Costs 4 Ways:

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3. Points feature self-sharpening design. There are eight point shapes to choose from.
4. Cast design permits extra metal at wear points. Points are heat treated and differentially hardened for long life.

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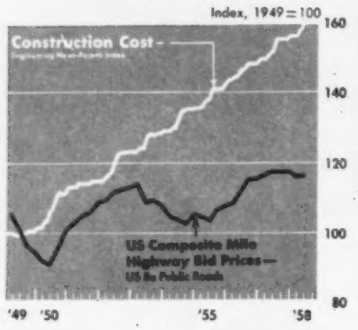
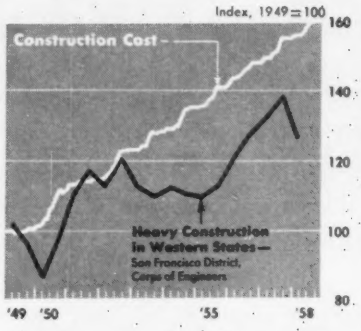
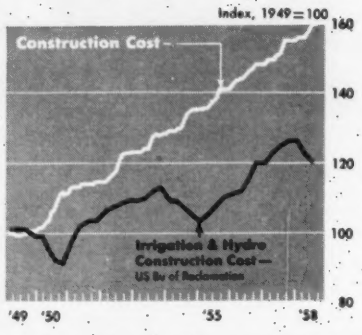


Highway bid prices are below their peak, but the downtrend has halted.



Heavy construction bids in western states are down sharply in 1958.



Hydro and irrigation construction costs ease down from January high.

Contractors Trim Bid Prices

CONTRACTORS ARE BIDDING lower for heavy construction this year than last. The reasons: increased competition for new work; more stable prices of materials and machinery; and greater availability of materials, machinery, and manpower. Also contributing is the greater availability of working capital loans at lower interest rates.

This year's downturn in contractors' bid prices is evident in the movements of three key indicators. The downtrend in highway bid prices, as measured by the Bureau of Public Roads Composite Mile Index, has been less than in other construction. This index dropped 2.1% in the first quarter of 1958, then moved back up a bit in the second quarter. However, it was still almost 1% under the year-ago point.

Bid prices for heavy construction in the western states fell by 8.7% in the first half of 1958, according to the index of the San Francisco District of Army Engineers. This was the first decline in the index since the first six months of 1955.

The third indicator is the Bureau of Reclamation Composite Construction Cost Index for 17 western states and Alaska. From a record high in January, 1958, it had dropped by 4.6% as of July. This latest quarterly value is the lowest since January, 1957.

Contributing to the decline in the Bureau of Reclamation Composite Index are lower costs for several types of work handled by the Bureau. Earth dam costs in July, for example, were 9.8% below a year ago. Canal costs were down 6.6%; steel bridges, 5.3%; laterals and drains, 3.8%; and primary roads, 3.2%. Concrete dam costs show a more moderate 2.6% decline.

States Report Highway Bid Prices Falling

The modest downtrend in the Bureau of Public Roads Composite Mile Price Index for federal-aid highways results from the fact that in some states the bid price trend has been up, partly offsetting price drops in other states.

Of nine states reporting quarterly highway bid price indexes, seven showed prices moving down in the first quarter. Drops generally ranged between 6% and 9%. In the second quarter, four of these states noted a continuing downtrend in average bid prices. California was down 4.5%; Idaho, 12.9%; Nevada, 7.8%; and Washington 3.5%.

Though New York State's highway price index rose in the first quarter, it dropped 3.7% in the second quarter. Moreover, August lettings went at contract prices averaging 20% below engineering estimates.

Prices may not remain low for long, however. Signs of a turnaround in the bid price trend are the moderate reversal in the BPR's second quarter Composite Mile Index and second quarter increases in four states: Colorado, Oregon, South Dakota, and Texas.

continued on page 33

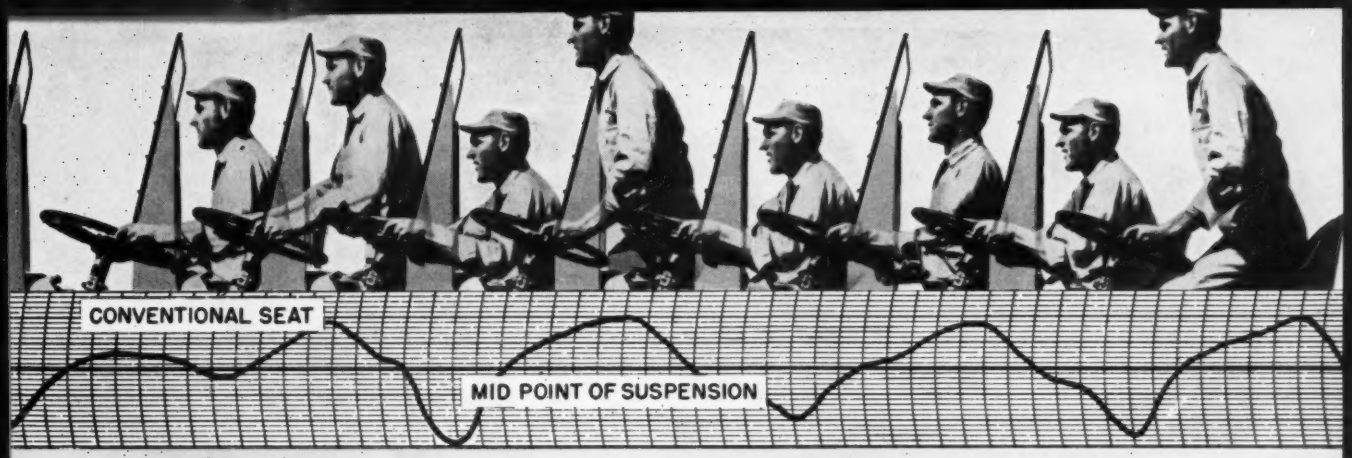
Highway Bidding Trends in 1958

Reported to CM&E by state highway departments and U.S. Bureau of Public Roads

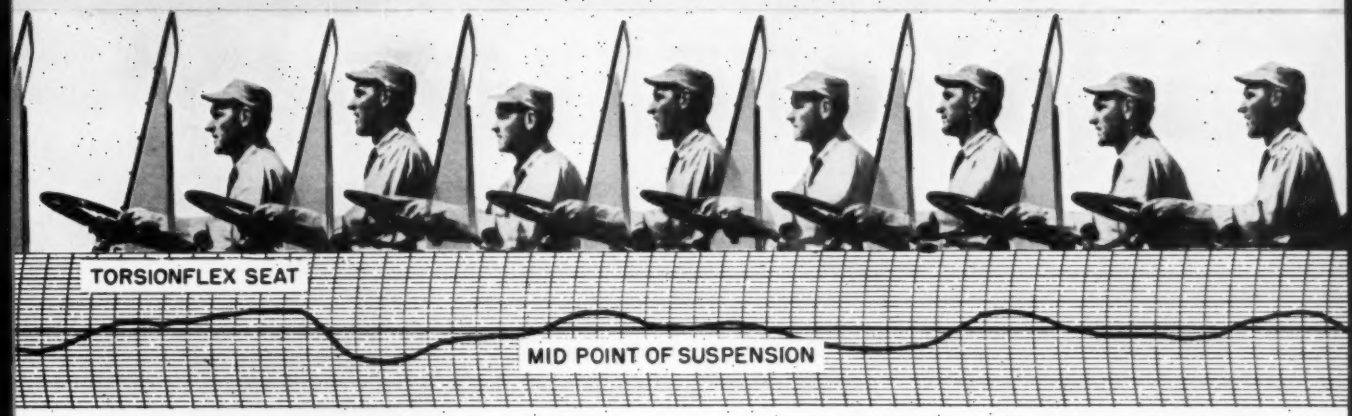
BID PRICES	Index 1949=100 2nd Q '58	Change from Q1 '58 %	Change from Q2 '57 %
These indexes are UP . . .			
U.S. Composite, BPR	115.6	+ 0.9	- 0.8
Colorado	102.5	+ 9.4	- 2.8
Michigan (est.)	117.4a	+ 0.3b	+ 1.9a
Oregon	99.4	+13.0	-10.9
South Dakota	98.4	+18.9	- 0.1
Texas	131.7	+ 8.3	+ 9.2
. . . while these are DOWN			
California	121.1	- 4.5	-13.5
Idaho (1950=100)	92.1	-12.9	-15.5
Minnesota	123.8a	- 1.0b	- 4.4a
Nevada (1955=100)	108.0	- 7.8	-17.2
New York	131.6	- 3.7	+ 1.9
Washington	97.9	- 3.5	- 9.5

NUMBER OF BIDDERS PER JOB	Number of Bids Per Project		
DOWN in these states			
California	5.4	9.3	5.5
Michigan	6.3a	7.3b	5.4a
Nevada	6.6a	8.8	5.2a
New York	6.0	7.0	4.0
Oregon	6.5	10.4	5.6
Texas	4.7	6.3	5.6
Washington	6.0	9.1	4.9
STEADY in Minnesota	7.0a	7.0b	9.0a
UP in Idaho	7.5	7.1	5.0

(a) January-June (b) July-December '57



Operator efficiency increases with . . . the new Caterpillar Torsionflex Seat



New Torsionflex Seat for Caterpillar wheel Tractors increases operator efficiency and comfort—provides a "highway" ride in off-highway conditions. Note the difference between the ride in the Torsionflex Seat and the conventional seat, as illustrated by this graph made over the same rough test course.

The Torsionflex Seat is just one of many new features introduced by Caterpillar to help increase earthmoving production!

Over the years Caterpillar has been the leader in improving earthmoving equipment with one aim in mind: *to move more dirt faster at lower cost.* No advance, from strengthening a 7-pound piston to redesigning a 30-ton rig, has been overlooked to increase the efficiency of Caterpillar-built machines, as well as the efficiency, comfort and safety of the men who operate them!

Now, in the new Torsionflex Seat, Caterpillar introduces a new concept in wheel tractor seat suspension—to give the operator maximum comfort over the roughest terrain. The new seat conserves his energy, lessens his fatigue, enables him to do more work per shift.

Test course proves superiority of Torsionflex Seat

The graph here shows the improved ride made possible by the Torsionflex Seat. Two rubber-tired machines, one with this new seat and the other with the conventional seat, were run over the same rough test course at the same speed. The lines in the graph were plotted by instruments attached to the operator. The horizontal component of the lines represents forward travel by the operator, while the vertical component represents his up and down motion. Note the big difference in the ride!

The new seat is just one of many improvements, large and small, being made constantly by Caterpillar throughout its line—tractors, scrapers, motor graders, other earthmovers. For modern, heavy-duty equipment that will increase your production and lower your costs, see your Caterpillar Dealer!

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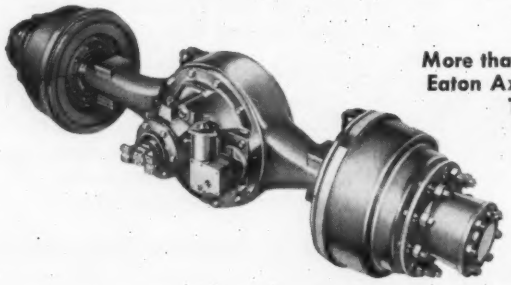
ORDINARY AXLE SHAFT



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Keep an Eye on Alaska

Final touches are being added to set the stage for a big construction market in Alaska. Now that Alaskans have voted acceptance of the proposition to become the 49th state of the United States, the curtain is about to go up on what may eventually be the largest new construction market in the country.

A sample of what construction men can expect in this region is indicated by Construction Methods' figures on heavy construction in the planning stage. Alaska's Backlog of Proposed Work climbed to a record high of $250 million as of July 31. This is more than double the backlog total as of December 31, 1954, only three and one-half years earlier. Moreover, it's an increase of 17% during the first seven months of 1958. The backlog is sure to rise still higher during the months ahead.

Federal construction projects (mainly military) have been the mainstay of Alaska construction so far. Federal work accounts for 44% of the total estimated cost of all projects in Alaska's backlog and represents an unusually high 85% ($60.2 million) of total awards let during the first seven months of this year ($70.5 million, according to Construction Methods figures).

But private work in the planing stage is now challenging fed-

Backlog of Alaskan Construction *(in millions of dollars)*

Type of Work	'50	'51	'52	'53	'54	'55	'56	'57	'58
TOTAL	$12.8	$55.8	$147.7	$115.0	$121.9	$206.1	$214.1	$213.4	$248.9
By Ownership									
Private	7.6	14.8	17.5	19.9	21.2	69.8	88.9	58.6	86.3
Public	5.3	41.0	130.2	95.1	100.7	136.3	125.2	154.8	162.6
Municipal	0.1	16.1	20.7	28.8	34.3	36.7	50.2	59.0	52.2
Federal	5.2	24.9	109.5	66.4	66.4	99.6	75.0	95.8	110.4
By Type of Work									
PUBLIC									
Waterworks	0.1	16.1	16.7	16.7	16.9	16.9	17.0	18.5	18.3
Sewerage	—	—	0.6	1.7	4.8	5.0	5.0	5.7	5.9
Bridges	—	—	—	—	—	—	—	0.9	1.4
Highways	—	3.0	44.0	34.7	31.7	29.5	25.4	42.6	49.3
Earthwork, dams, waterways	4.4	5.9	5.9	10.9	10.9	14.8	15.0	16.5	15.7
Buildings	0.8	2.6	26.0	19.2	21.6	33.6	31.7	41.1	47.1
Unclassified	—	13.4	36.9	11.9	14.8	36.5	31.2	29.5	25.0
PRIVATE									
Commercial bldgs.	—	—	—	—	0.5	0.5	0.5	9.5	11.2
Mass housing	7.6	11.2	13.8	14.4	14.7	14.7	14.7	13.7	23.9
Industrial bldgs.	—	3.6	3.6	4.7	4.7	52.4	70.5	32.1	32.2
Unclassified	—	—	—	0.8	1.4	2.3	3.3	3.3	19.1

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WHEEL
SELF-PROPELLED ROLLER
NOW . . . YOU CAN CUT YOUR COMPACTION TIME IN HALF!
This new exclusive BMCO 13 wheel roller makes it possible for you to do the same amount of work in half the time!
With complete oscillation on all wheels and power steering this 13 wheel BMCO compactor is easy to handle. With the largest power unit in its class and extra displacement . . . this is the compactor for you in '58.
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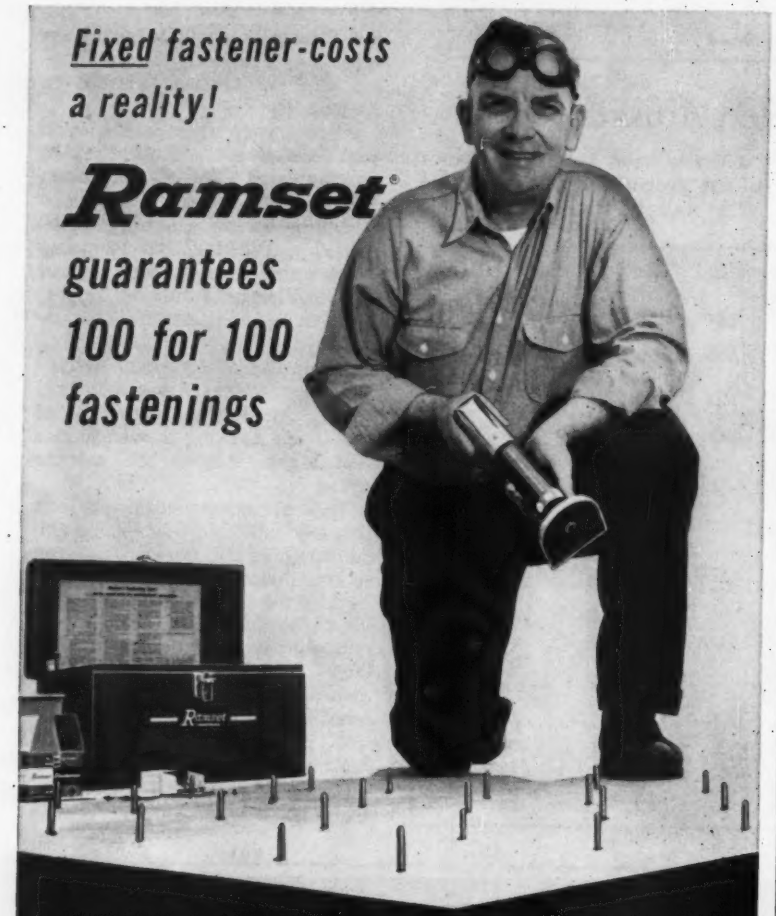

"The Boss is a happy man since we started using RAMSET."

On any approved job, RAMSET replaces any ineffective fasteners free. As a result, fastener costs are fixed... you pay only for the number of fasteners called for on the blueprint.

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For more than 10 years, the RAMSET Powder-Actuated Fastening System has proved itself fast and sure on jobs in concrete and steel. The tool is easiest to use, the fasteners the best you can buy. Austempering enables them to perform where other fasteners fail. And RAMSET specialists are on call to give you the answer to any fastening problem, right on the job.

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CONSTRUCTION BUSINESS...
continued

eral work for the lead. Private projects account for one-third of Alaska's backlog. This category jumped 47% in the first seven months of this year.

Alaska's most desperate need is roads. The current 5,000-mile system is inadequate. That's why highways account for the largest single chunk of the backlog, $49.3 million or double the roads backlog in December, 1956.

SOME BIG CONTRACT AWARDS OF THE MONTH

American Bridge Div., 208 S. LaSalle St., Chicago, Ill. Primary and structural mill at Chicago's South Works, 8135-65 Brandon, Chicago, Ill. United States Steel Corp., 79 Broadway, New York, N. Y. $120,000,000.

Morrison - Knudsen Co., 319 Broadway Ave., Boise, Idaho, **F&S Construction Co.,** 1330 Chicago St., Butte, Mont., and Kaiser Eng. Div. of **Henry J. Kaiser Co.** Navajo Dam, on San Juan River, Rio Arriba Co., New Mexico and Colorado. Bureau Reclamation, Denver, Colo. $22,822,624.

H R H Construction Corp., 579 Fifth Ave., New York 17, N. Y. Luna Park houses in area of Neptune Ave., W. 8th St., Surf and Stillwell Ave., Brooklyn Boro, Brooklyn, N. Y. New York City Housing Authority, 299 Broadway. New York, N. Y. $18,963,450.

Gust K. Newberg Construction Co. and **Hoyle-Newberg Construction Co., Inc.,** 2040 N. Ashland, Chicago, Ill. 235 units Capehart housing at K. I. Sawyer Air Force Base, Marquette, Mich. Base Procurement Officer, K. I. Sawyer Air Force Base, Marquette, Mich. $10,127,000.

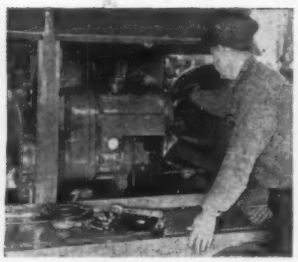
A. Mintz Contr. Co., 4098 Lee Rd., Cleveland 28, Ohio. 50-unit shopping center, 150,000-sq ft department store in North Ridgeville, Ohio. Ridgeview Center, Inc., 4098 Lee Rd., Cleveland 28, Ohio. $10,000,000.

Now being told on the inside...

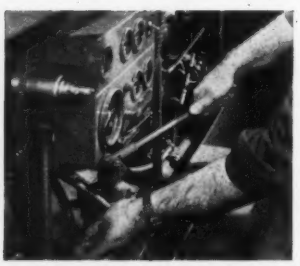
THE BLUE BRUTE ROTARY STORY

all about the 5 big benefits of the portable compressor with the exclusive over/under design ☞

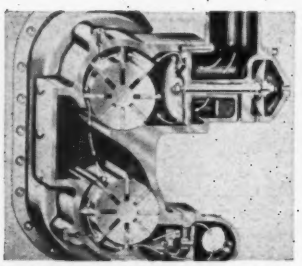
ONLY BLUE BRUTE



Accessibility—All the principal working parts of a Blue Brute rotary can be removed and replaced in just 40 minutes with standard tools! The reason is Over-Under Design which keeps the outboard end of each cylinder exposed. You can check it on the spot and make adjustments without delay.



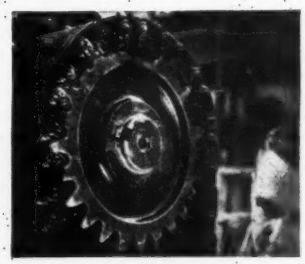
The Clutch—Unlike most rotaries, a Blue Brute's clutch allows you to warm up the engine *without engaging the compressor*. Less strain on the engine means easier starts, less wear and tear, years of extra life. As shown above the clutch is easy for the operator to engage and disengage.



Self-Draining Cylinders permit gravity flow of oil from low pressure cylinder through the interstage chamber, through the high pressure cylinder, and out the discharge to the oil reservoir. Oil cannot be trapped in cylinder low spots during shutdown. No chance for sludge or tar clogging the compressor.

Two-Stage Oil Separation—The first stage is a Vortex separator in the compressor discharge which removes 95% of the oil. (In the 125′ rotary a velocity change elbow is used.) The second stage is a vertical filter located in the air receiver. This is a long-life filter, easy and inexpensive to renew.

OFFERS THE BIG 5 thanks to exclusive over/under* rotary compressor design



Chain Drive—Driving power, from the high pressure rotor shaft to the low pressure shaft, is a strong silent chain drive. Based on actual field experience, this drive has a predicted life in excess of 20,000 hours, or 10 hours a day, 200 days a year, for more than 10 years!

**Over/under design is a unique method of construction that puts the second stage compressor cylinder directly under the first stage. It is an exclusive Worthington development that benefits you five ways.*

Compare the Blue Brute rotary compressors with other leading units, feature for feature. Only the Blue Brute has the big 5 benefits. Blue Brute rotary compressors are available in 125′, 210′, 315′, and 600′ sizes from your nearby Worthington Blue Brute distributor. Ask for a demonstration. Worthington Corporation, Portable Compressor & Contractors' Tool Division, Holyoke, Mass. In Canada: Worthington Ltd., Brantford, Ont.

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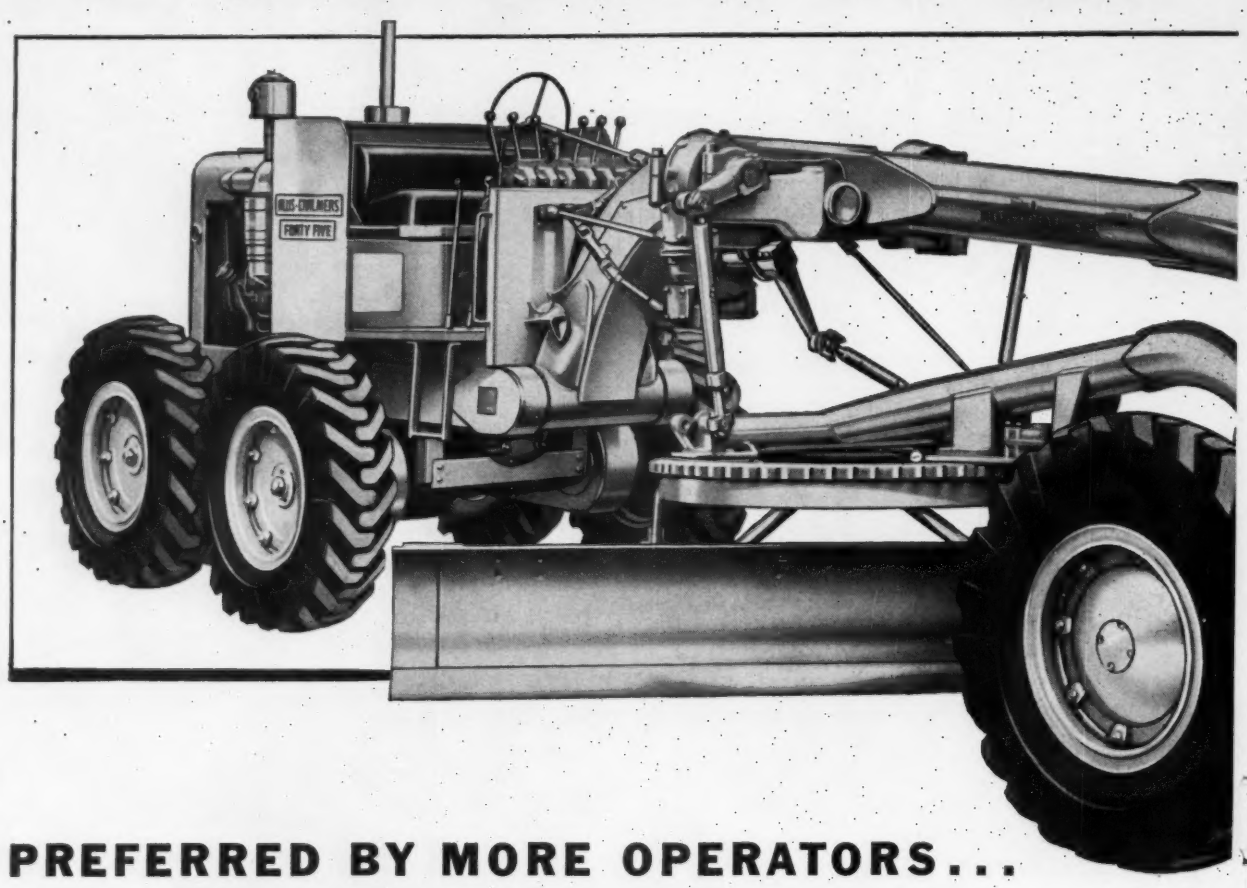
For consistently tough jobs, compare with any other heavy-duty motor grader



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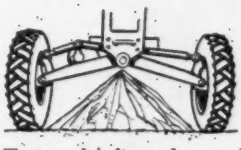
The FORTY FIVE has the power, weight, traction and speeds you need for high-production grading. Superior stability and precision control give you deep precision cuts or smooth finishes. The FORTY FIVE is built to take the shocks and strains of heavy-duty service — and to keep production steady. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

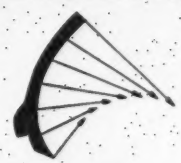
Allis-Chalmers FORTY FIVE performance

- 120 brake hp
- 6 forward speeds to 20.6 mph
- 3 reverse speeds to 7.0 mph
- 23,800 lb approx.

Advantages that mean more production . . . less maintenance . . . easier and better operation

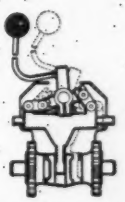


Extra high axle and throat clearance means bigger loads at the blade.

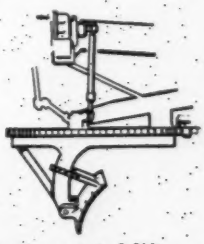


The ROLL-AWAY moldboard rolls dirt, gives more performance per horsepower, more production per gallon.

Fully enclosed power steering — easy control under all conditions.

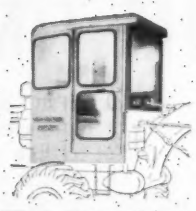


Toggle-type controls are exclusive with Allis-Chalmers.

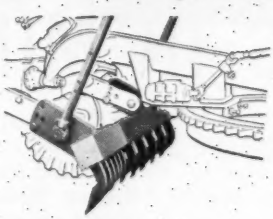


Front-mounted lift cases eliminate long shafts that twist under loads.

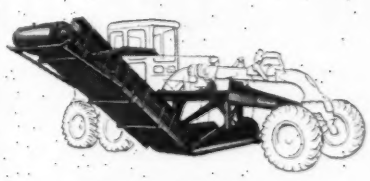
Matched attachments and accessories make it a year-round producer



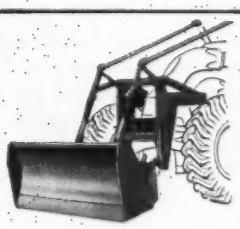
All-steel, stand-up cab



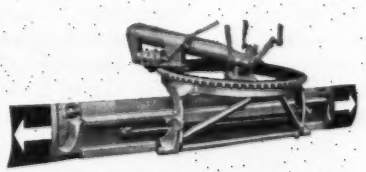
11-tooth, V-type scarifier



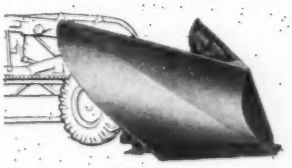
Hancock elevator



8-foot bulldozer



Hydraulic, shiftable moldboard



V-type snowplow

ROLL-AWAY is an Allis-Chalmers trademark.

"FASTEST, SMOOTHEST BACKHOE I've handled in 10 years as an operator" says E. W. Ives about this American 175. On shallow trenching jobs like this one at 18 inches, the American maintains accurate depth . . . cuts clean-up work . . . saves time and labor. Maximum digging ranges of this ½-yard hoe are 28 feet, 3 inches out . . . 18 feet down! Easy to transport . . . moves on and off lowboy under its own power (below) . . . the American 175 is fast between jobs.

FAST, MOBILE AMERICAN BACKHOE ON...OFF JOBS IN MINIMUM TIME

Speed puts profits in the excavating operations of Kutchins Company, Lansing, Michigan. Their American 175 Backhoe is fast *on* the job . . . so easy to move that it's fast *between* jobs. Gene Berry, Kutchins' Job Superintendent and Vice President says, ". . . in curb and gutter excavating, it's often necessary to move to new locations several times a day.

"Our American's maneuverability—its fast digging ability enables us to get on and off jobs in minimum time . . . stay ahead in our excavating." Kutchins reports excellent maintenance records on their ½-yard and ¾-yard Americans.

Profitable curb and gutter work demands a hoe that will maintain accurate, level depth in a shallow trench . . . require a minimum of hand clean up! American does the job . . . proof of its fine control system. Efficient design of the 175 results in substantial weight reductions without loss of strength or durability. Power and profit robbing deadweight is cut to the minimum!

There's only one way to prove Americans' performance . . . see them at work *on the job*. Talk to owners and operators too! For technical details call your American Distributor who has facts on a complete line of crawler and truck-mounted cranes and excavators. Capacities start at ½-yard, 12½ tons!

EXCAVATORS-CRANES to 2 yds.-50 tons
LOCOMOTIVE CRANES to 130 tons
DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

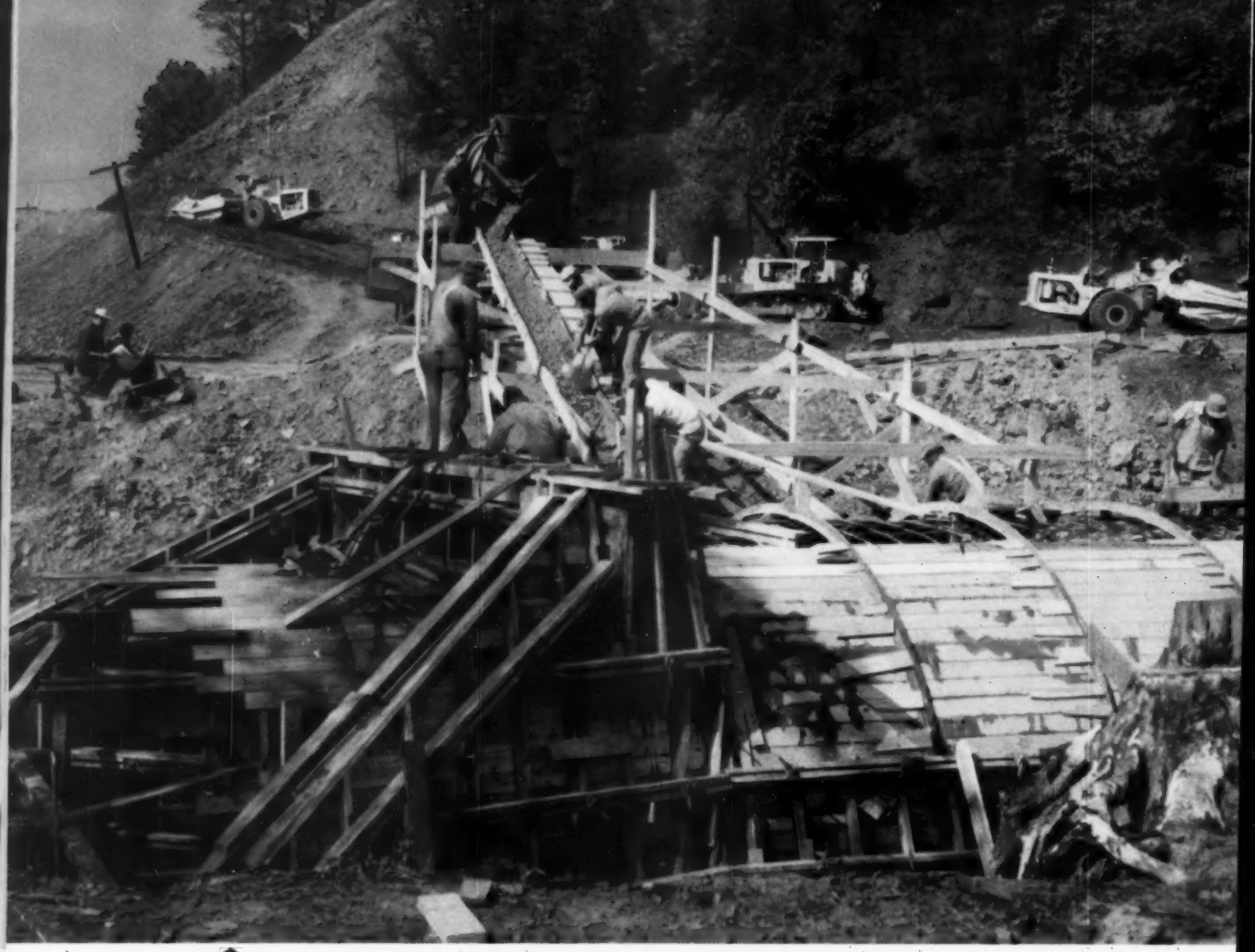
CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

"We're extremely well satisfied with Gulf. Can't beat the products . . . or the service," says the job superintendent of S. Gavlik, Contractor, of Glenwillard, Pennsylvania. Standing above are (left to right): A. Tietjen, Superintendent; R. S. Garrison, Assistant Superintendent; H. H. Hossler, Gulf Representative; S. Gavlik, General Contractor.

Take it from leading contractors . . .

GULF MAKES THINGS RUN BETTER!

GULF



Water barrier goes underground. When a creek obstructs a 3½-mile road project, move the creek! That's what S. Gavlik, Contractor, did to relocate Route 422 near Indiana, Pennsylvania. The project, let under the Federal Highway Program, included three sub-surface concrete structures to carry off surplus water from the creek. Photo above shows concrete being poured for one of the three sub-surface structures. S. Gavlik is a long-time Gulf user.

Moving a creek . . . building a road . . . dredging a channel—

GULF MAKES THINGS RUN BETTER!

You can better your operation three ways when you depend on Gulf for your fuels and lubricants.

- You're sure of prompt delivery. 1500 strategically located warehouses—in 32 states—provide an unfailing supply of the fuels and lubricants you need.
- Your Gulf Sales Engineer will be on the job to help your operating and maintenance men get most efficient use of petroleum products. And he's backed by 1300 Gulf scientists and engineers at Gulf Research Center.
- Gulf quality fuels and lubricants insure best performance from your equipment—help you avoid mechanical delays. You'll have a smoother running job . . . and lower operating costs . . . because Gulf makes things run better.

Re-routing a route. One of the early jobs to be let under the Federal Highway Act was the relocation of Route 66 at Mamont, Pennsylvania. This job, which involved building an overpass over Route 80, was awarded to Ralph Myers Contracting Corporation of Pittsburgh. In the photo above are H. H. Hossler, Gulf Sales Representative, and Marion Hoke, Superintendent of Ralph Myers Contracting Corporation, on the job site. Myers depends on Gulf products to prevent mechanical delays.

Digging the big ditch, underwater. The South Cornwall Channel, a vital link in the $900,000,000 St. Lawrence Power-Seaway Project, was dredged by S. J. Groves & Sons Company of New York City. Groves removed about 1,800,000 cubic yards. Tug and dragline used clean-burning Gulf diesel fuel.

Expediting excavations. Below: On the huge St. Lawrence Power-Seaway Project one of the many contractors who used Gulf products is the firm of Jack and Jim Maser, Excavators, of Lancaster, Pennsylvania. The photo below shows the late Charles Reynolds, Maser Project Superintendent, with Gulf Jobber John Pellegrino. Jack Nicholson, Gulf Sales Engineer, is at right.

2-million yard earth-moving job. In Spartanburg and Cherokee Counties, South Carolina, the P. C. Cochran Construction Company of York, S. C. contracted to improve Route 29. They moved over 2,000,000 cubic yards of earth in the process. Photo shows (left to right): Edley Lattimore, General Superintendent; P. C. Cochran, Owner, and H. H. Lane, Gulf Sales Engineer.

ON YOUR NEXT JOB . . . LARGE OR SMALL . . . GO GULF! AND RIGHT NOW, USE THE COUPON BELOW FOR MORE INFORMATION

GULF OIL CORPORATION
Department DM, Gulf Building
Pittsburgh 30, Pa.

☐ Send copy of "Gulf and Your Business"

☐ Send copy of the new "Contractors' Guide" (equipment operation and maintenance manual)

Name_____

Title_____

Company_____

Street_____

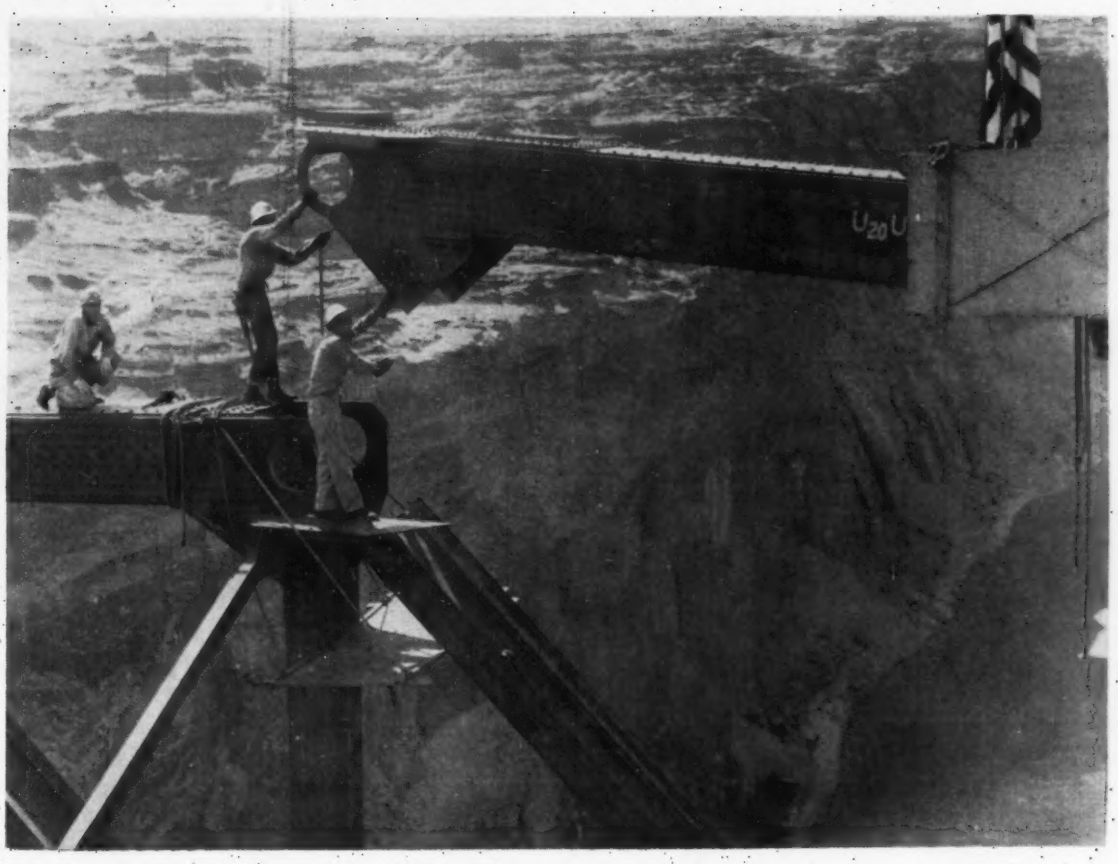
City_____ Zone____ State_____

GULF

GULF MAKES THINGS RUN BETTER!

SP 9296

PICTURE OF THE MONTH



High Bridge Spans Glen Canyon

• Bridgebuilders of the Kiewit-Judson Pacific Murphy joint venture set the last giant steel panel for the highest bridge in the Western Hemisphere. The Colorado River Bridge rises 700 ft over Glen Canyon, linking the states of Utah and Arizona at the site of Glen Canyon Dam. The contractor erected the bridge across the 1,200-ft-wide gorge in two years—and with a perfect safety record. It will provide access for the heavy equipment and materials that Merritt-Chapman & Scott Corp. will bring in to build the $108-million Glen Canyon Dam for the Bureau of Reclamation.

NEW 1½ yd.

Move up to The Manitowoc 2300

Convertible to:

35 Ton Crane

Has low center of gravity and solid stability. Precise, positive control . . . booms to 130'.

1½-Yd. Hoe

Cuts an 11' level bottom as deep as 32' without machine travel. Has air controls and power brakes.

Big Capacity Dragline and Clam

Long reach dragline has 1½ - 2½ yd. capacity. Big output clam features fastest closing-hoisting speed.

HERE is a new, heavy, rugged shovel ready to give you *true* 1½ yd. capacity on any job you can name . . . with many profit-making features you would expect to find only on the largest units. The Model 2300 delivers smooth, powerful, steady performance in dirt or rock . . . as a big capacity shovel, a fast swinging dragline, or heavy-lifting crane.

For economical operation with little downtime; for long machine life with high trade-in value; and for full capacity and big output, the Model 2300 is a real all-around rig . . . the ideal "key" machine for your equipment fleet.

You can make more money on today's jobs only if you have "today's" equipment . . . and the Manitowoc Model 2300 is as modern as tomorrow, now and for years to come! Ask your Manitowoc distributor now for literature and full specifications!

SHOVEL!

with *MANY FEATURES* found only on the largest machines

- Simple, "Power-flo" Slide Pinion Drive ... Only 11 Gears in Entire Upper Works
- Faster Cycle Speeds
- New, Easy Hydraulic — Jack Adjustment for Proper Crawler Tensions
- Air cooled, Disc-Type Swing Clutch
- Huge, 62" Ring Gear ... Big 7½" King Pin — Largest in Its Class
- Simplified Air Controls ... Smooth Torque Converter
- Modern, Centralized Lubrication

There are dozens of other important features that give you a long-life, big output machine. In the rugged lower works you'll find a mighty, one-piece carbody; long, wide-span crawlers with fully enclosed pads; fast, easy crawler tread adjustment; a heavy duty tread guide patterned after big machine design for perfect tread alignment; and a flat design roller path to provide precise load distribution.

The simply designed main machinery assures fastest cycle speeds . . . directs power straight to the job at hand. Anti-friction bearings are used in all high speed parts; air cooling of the swing clutch assembly makes for uniform, constant friction — better performance; a tough, precise swing lock provides positive meshing of the swing lock on the swing gear for absolute safety. In the heavy duty drum shaft and main drive, splines are used instead of keyways so that strain is spread over a wide area; the solid rotating bed combines a heavy, manganese alloy steel casting and structurals for a solid base; and for the power to suit your job, either direct drive or torque converter are available.

Manitowoc

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	½-YD. - 5½-YD.	½-YD. - 6-YD.	½-YD. - 2½-YD.

Digging Foundation Footings...

Digging footings as well as grading, this Crawler-Mounted, multi-purpose Gradall speeds completion of Detroit's new, modern parking garage located under Grand Circus Park.

Gradall increases production 300% — saves $350 a day

— for Canonie Construction Co., South Haven, Michigan

Gradall cuts costs on all these jobs — and more!

- Hand finishing and clean-up
- Excavating and loading
- Trenching and backfilling
- Snow and ice removal
- Ditch digging and cleaning
- Grading and sloping
- Materials handling
- Loading boulders
- Placing culverts, tanks, curbs, etc.

CANONIE Construction Company, South Haven, Michigan, used Gradall's power and accuracy to dig irregular-shaped footings for Detroit's new underground parking garage in Grand Circus Park. Working in sticky blue clay, Gradall rapidly carved footings 17 feet wide by 2 feet, 3 inches deep.

Previously, five men working with shovels, picks and compressor tools could complete only one footing a day. With a Gradall on the job, 4 footings a day were easily excavated, plus fine grading between footers — at an estimated saving of $350 a day.

This report is typical of the cost-cutting jobs being handled daily by Gradalls throughout the country. Why not find out for yourself. Arrange for an on-the-job demonstration by calling your nearest Gradall Distributor today.

Distributors in over 75 principal cities in the United States and Canada

® Reg. U.S. Pat. Off.

Gradall®
A Product of
WARNER & SWASEY
CLEVELAND 3, OHIO

MANUFACTURERS OF **Gradall**, **Hopto** EXCAVATORS AND **Duplex** TRUCKS

Construction News in Pictures...

Two-Lane Paving

Gordon H. Ball, Inc., of Danville, Calif., places concrete paving in 24-ft widths on a 5.2-mi stretch of U.S. 40 near Floriston, Calif. Paving train includes Koehring Twinbatch pavers, a Blaw-Knox spreader-finisher, a float assembled from a Jaeger-Lakewood finisher frame, and a Lewis reciprocating screed.

Cliff-Top Dozer

High on cliff above the Niagara River, an International Harvester TD-24 dozes some of the 9,000,000 yd of rock that must be moved during construction of the $625-million Niagara Power Project at Lewiston, N.Y. The job is one of the largest hydroelectric installations in the world. Merritt-Chapman & Scott is the contractor.

Pipe Carrier

United Concrete Pipe Corp. built this 50-ft-high pipe carrier to move 85-ton pipe sections 24-ft long from its casting plant to an oceanside launching platform. A Caterpillar D8 tows the pipe carrier. Pipe will be laid on the ocean bottom as part of a $20-million effluent outfall for the Los Angeles Hyperion Treatment Plant.

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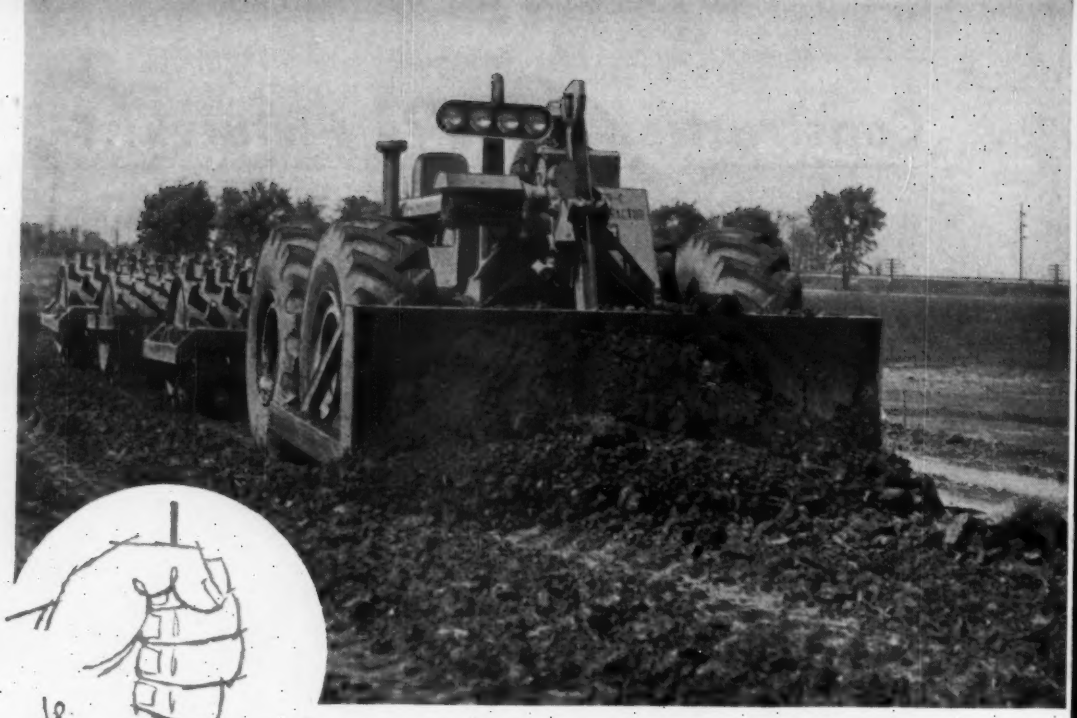
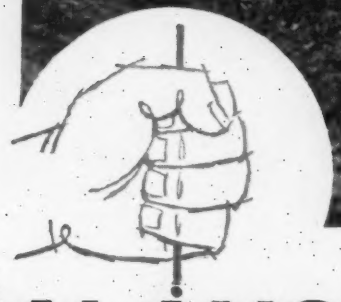
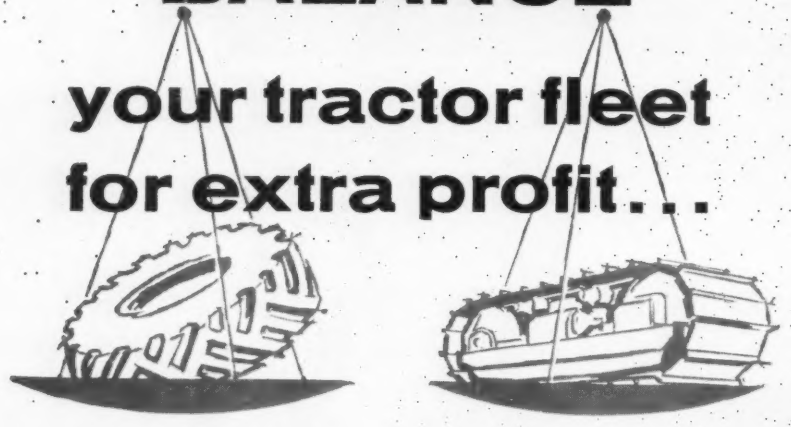




BALANCE

your tractor fleet for extra profit...



When you plan dirtmoving contracts, you are usually faced with a wide variety of tractor assignments.

The question is: What kind of tractor — crawler-mounted or rubber-tired — will pay-off best in the work you're handling?

Repairs access road to isolated farm

Farmer's access road 5 miles down the pike is washed out. He can't get his pick-up out to the road, can't move his produce to market. Your Tournatractor is on the job in 20 minutes... repairs road in 20 minutes... is back on its regular job in another 20 minutes. You've saved money, made friends.

Hires out for plus profits

A property owner near your job wants land leveled for building site, or drainage. You "borrow" Tournatractor from production fleet ... send it over highways, through city streets to the work site. Whole job takes only a few hours. Tournatractor earns $75 or so extra pay ... without delaying the main job.

Balances production — cuts moving time

When your production fleet moves, self-propelled scrapers roll over highways to the new job. Tournatractor rolls with 'em. Scrapers can begin work on arrival, if a Tournatractor is used to push-load. (Crawler-pushers are usually latecomers since they must be loaded on flat-beds, hauled to job site, and ramp-unloaded.) When short hauls bunch-up your scrapers in the cut, again drive in Tournatractor. This tractor will quickly balance your pusher operation, until longer hauls get your production fleet back into efficient spacing.

Clears right-of-way for production earthmovers

While your heavy-duty crawlers grub out stumps or break up shale, there's plenty of rough work that a speedy tractor-on-rubber can handle . . . scattered work that will get your production haulers working sooner. Use a Tournatractor to pile logs, stumps, and brush, build and maintain haul roads, doze boulders, clear turn-around areas, connect access roads, cut drainage ditches to keep borrow pits and haul roads dry.

Big, 2-ft wide tires aid compaction

Material on fill is piling up fast. It needs continuous compaction or it will delay scraper cycles. Tournatractor levels high spots with its dozer blade, at the same time it pulls a 35-ton, 6-drum sheepsfoot roller. Tournatractor's 2' wide tires, carrying 20 tons of weight, combine prepacking with heavy 30 to 50-ton follow-up for most effective compaction.

Quickly reconditions mucky haul roads

Your heavily-loaded scrapers cut deep ruts into wet haul roads . . . slow production cycles. Tournatractor, called from an assignment a mile away, can be regrading damaged haul road in 5 minutes. With quick forward and reverse passes, Tournatractor dozes in fill, levels surface, cuts a trench to improve drainage . . . puts production scrapers back on schedule. In fact, it's profitable on most jobs to have this quickly available unit patrol your heavily used haul roads several times a day.

For heavy, short-haul work? For scattered work?

For most heavy, short-haul work . . . for dozing in rock-filled earth . . . and for "stay put" work in limited areas . . . slow-moving crawler-tractors fill the bill, because they have more lugging power at slow speeds.

For work where travel range is important . . . for leveling scattered fill . . . towing "part-time" scrapers . . . cleaning up . . . maintaining haul and access roads . . . push-loading . . . finish-grading . . . and doing dozens of "chores" scattered over a wide work area . . . your best bet is today's improved 210-hp, 17-mph, rubber-tired LeTourneau-Westinghouse Tournatractor®.

Crawlers to "lug" . . . tires to "run"

To handle your work at lowest cost you'll want to team L-W Tournatractors and crawlers in proper balance . . . using crawlers to "lug" and Tournatractors to "run."

Of course, as every project varies, you can't work out an exact mathematical formula between crawlers and rubber tires. Start with rubber-tired tractors where you obviously need most of their speed and maneuverability. Then, extend your rubber-tired percentage as you find it profitable for your operation. Keep in mind, as you plan, the growing importance of mobility in today's bigger, large-area dirtmoving jobs.

Some contractors say a tractor fleet should be evenly balanced . . . half "track," half "rubber." Others find that one Tournatractor does the work of two crawlers on their particular operations, and plan accordingly.

We've pictured here, some typical circumstances where a work-and-run tractor-on-rubber helping on your contracts, will bring you maximum profit.

Cuts emergency drainage ditch

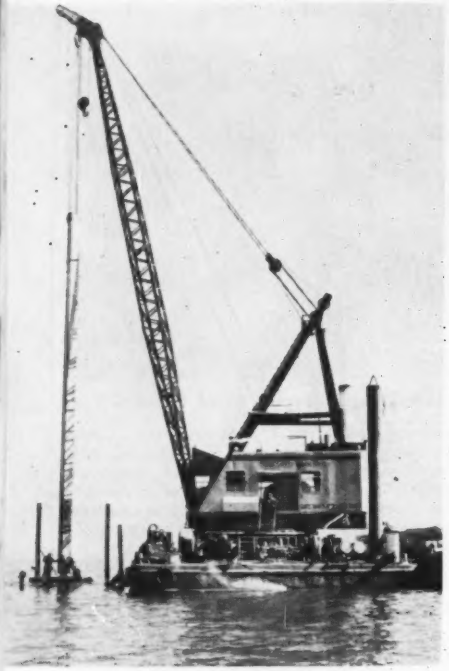
Rain forecast for tonight . . . could easily flood poorly-drained cut in spongy clay . . . could side-line your production fleet for days. In 10 minutes, speedy Tournatractor drives 2 miles . . . soon digs drainage ditch, then smooths cut and haul roads to eliminate water pockets. No production delay today! And, come heavy rains tonight, the dirt will still roll on schedule tomorrow!

CT-1517-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

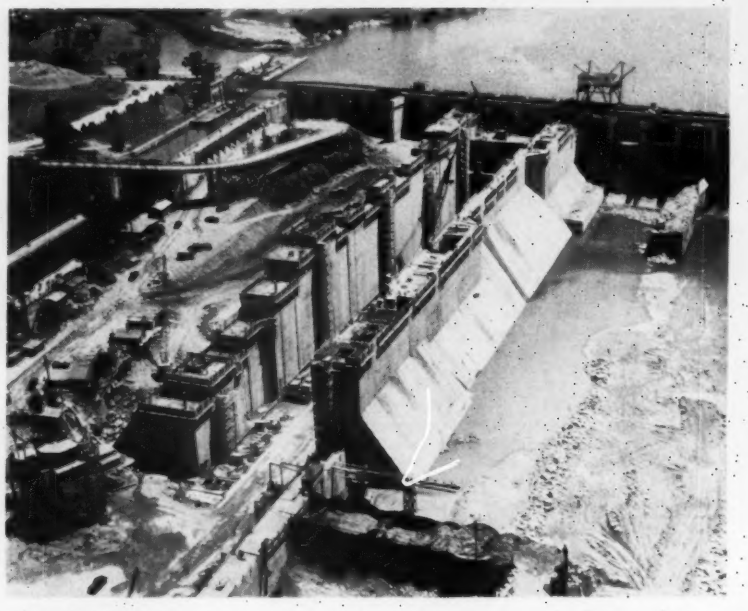
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



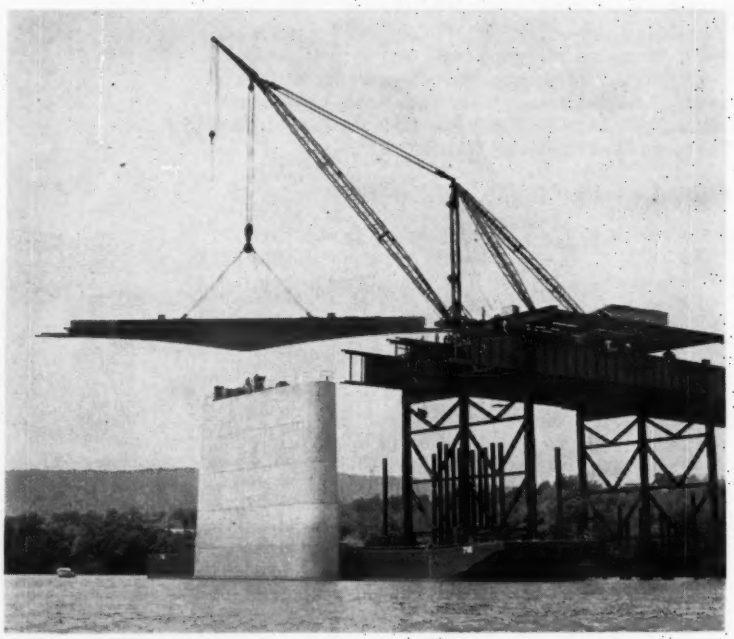
Bridge Supports

Barge-mounted derrick rigged with Acco Hazard wire rope slings lowers an 85-ft prestressed concrete pile into position in Tampa Bay, Fla. Hardaway Contracting Co. of Columbus, Ga., will place a total of 2,952 of these piles to support the 15,872-ft Middle-Bay Bridge across Tampa Bay. The four-lane bridge will cost about $6.5 million.



Highest Lift

Tennessee Valley Authority's new lock under construction at Wilson Dam, Muscle Shoals, Ala., will boast a single lift of 100 ft, the highest in the world. Lock walls, now 75% complete, will tower 124 ft in the air. The new lock will cut four hours from the present tow time between Pickwick Lake and Wilson Lake on the Tennessee River.



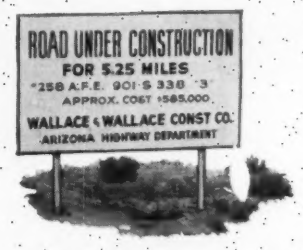
Spotting a Girder

Stiff-leg derrick traveler swings a big girder section into place on the Cedar Street Bridge across the Tennessee River at Chattanooga, Tenn. With a 115-ton traveler at each side of the bridge, Bethlehem Steel Co. will erect a total of 124 girder sections for the 2,641-ft highway bridge. Girder sections range up to 137½ ft long and weigh as much as 84 tons.

Open rich, new Arizona resources

Push-loaded by two crawlers in tandem, 28-yd. B Fullpak gets good load of decomposed granite on Phoenix Basin highway job. Many blast boulders buried in pulverized material made loading and spreading difficult.

with modern highway built by 28-yd. Fullpaks®



Some 30 mi. northeast of Phoenix, Ariz., the firm of Wallace & Wallace Construction Company has converted an old dirt trail into a modern road. It connects Payson, Ariz., with Phoenix — opening the rich mining, logging, and recreation potential of this area to greater use.

On this 5¼-mi. section, a total of 300,000 cu. yds. of decomposed granite and rock had to be moved. Final surfacing, consisted of crushed stone and oil penetration.

Chose B Fullpaks for long hauls

Wallace & Wallace used a shovel and a fleet of trucks to open the deepest cuts. Pioneer leveling of high points on short hauls was done by 4 crawler-drawn scrapers. Two of these were LeTourneau-Westinghouse machines.

Once the start was made, the Phoenix firm handled the long-haul work with two B Tournapulls® with 28-yd. Fullpak scrapers. Progress was steady.

Initially, material was tough, and had to be broken by blasting or ripping. Even then, loading was often slow and difficult because decomposed granite didn't always break up fine enough for easy entry into scraper bowl. However, "B's" were regularly push-loaded with 20 to 22 yds. by a pair of crawler tractors, double-headed for maximum power in the cut. A typical cycle of 3300' took 9 min. to complete.

"Can move more with 'B'"

"This 'B' is good," said Operator Bob Kelton. "I've run them all and this is the best I've ever been on. It loads easier, has good visibility, and I've got a seat up out of the dust. I can move lots more with B Fullpak."

Find out how B Tournapull with Fullpak Scraper can add to your profits on big-yardage jobs. Ask for full specifications and a demonstration.

One of Wallace & Wallace B 'Pulls' starts 800' haul, on Payson-Phoenix roadbuilding job. Cycles included 10% adverse grades on return.

B Fullpak swings around in tight U-turn at end of spread, for return to cut. New road was carved through rocky, hilly Arizona country.

†Trademark BP-1527-DCJ-1.

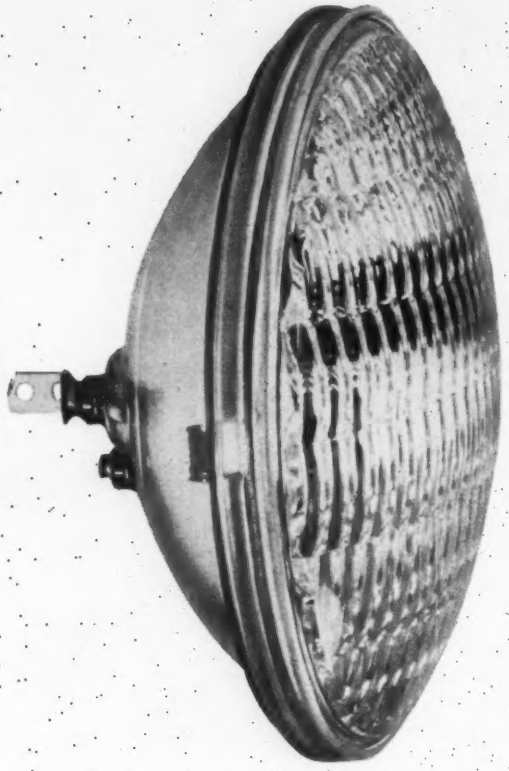
LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

G-E ALL-GLASS floodlamps for road building equipment

give brighter light longer because:

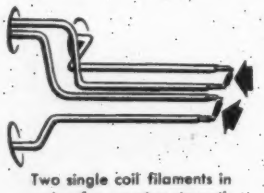


One-Piece construction eliminates premature dimming. Dust, dirt and moisture can't get inside a General Electric C.I.M. Floodlamp to scatter or dim light because the reflector and lens are fused together—hermetically sealed for the *full* life of the lamp. There's no gasket to loosen, therefore reflector *can't* get dirty and condensation *can't* form.

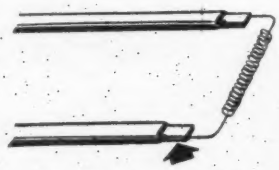
Rain and snow don't bother it either; both reflector and lens are made of special hard glass that won't crack when splattered by rain or snow.

There's no inner bulb to blacken. The whole unit is a bulb! And rugged, two-filament, shorter-coil design takes all the punishment hard working machinery dishes out. Broader beam pattern is ideal, too, with lens-reflector combination that throws a smooth, evenly distributed light all around the machine and on the work.

All-Glass C.I.M. Floodlamps are specially designed for bulldozers, graders, scrapers, crawlers and other road building, mining and construction machinery. Properly mounted in shock-proof housings, they provide ideal working light with minimum maintenance and maximum service life. G.E. makes a size to fit your requirements. Contact your nearby G-E lamp distributor or write: General Electric Co., Miniature Lamp Dept. CME-98, Nela Park, Cleveland 12, Ohio.



Two single coil filaments in series for greater strength



Vise-like grip adds resistance to filament breakage

SPECIFICATIONS FOR G-E C.I.M. FLOODLAMPS
(PAR-46 Bulbs—2 contact lugs)

G-E No.	Circuit Volts	Watts	Bulb Dia.	Designed Life
4078	6	50	5¾"	500 hours
4478	12	60	5¾"	500 hours
4578	24	60	5¾"	500 hours

Progress Is Our Most Important Product

GENERAL ELECTRIC

Built for
rugged
assignments . . .

Shown spreading fill on relocation of Ohio Route 4, near Wright Field, Dayton, is one of W. L. Johnson Co.'s two 190-hp Adams POWER-*Flow* graders. This torque-converter-equipped unit gives you effective work-power of infinite gear ratios . . . automatically matches power to work load. Result? You move more dirt, faster!

Firm uses another POWER-*Flow* for medium grading on another section of this 5.2-mile project. Note big 16.00-24 tires, that give traction and flotation in any material, under any working conditions.

but makes money on
routine
work, too . . .

Ohio contractor's POWER-*Flows*® outshine other graders

Just because a machine is built for really *rugged* assignments doesn't mean it can't make good money for you handling *routine* jobs on your projects, too. Take the two 190-hp Adams* 660 POWER-*Flow* graders W. L. Johnson Construction Co., and Associates, Columbus, Ohio, is using on the 5-million-dollar, 2-million-yard relocation of Ohio Route No. 4, near Dayton.

As you'd expect, these king-sized units can do a whale of a job on *heavy* grading . . . cutting high banks, digging deep ditches, leveling heavy fill. Yet, on *this* project, the POWER-*Flows* are also used on simpler tasks — like maintaining haul roads — where you might think a lighter machine could do better.

On Route 4, Johnson's graders are teamed with two of the 115-hp graders once considered big. Operator Paul Spencer says: "Talk about fast! It *really* does a job keeping our haul roads in shape!"

65% more hp, for ALL grading jobs

While you pay an extra 20 to 25% for a POWER-*Flow* you get 65% more horsepower, and a smooth efficiency of application of that power that lets you handle ANY and ALL grading jobs faster, easier and with much lower overall cost. Not only do you get more grader performance per dollar of investment but you also speed up your entire operation because your grader can do more job maintenance more quickly. Nor do you have to rent, or borrow a "big one" when your smaller grader just can't handle a job. The POWER-*Flow will* handle the toughest grader assignment . . . handle it *fast*.

"Easy controls, good visibility . . ."

The Johnson service crew reports that the big POWER-*Flow* uses less fuel than many graders with less horsepower . . . averaging only about 4 gallons an hour. And Operator Herbert Knisley sums up the firm's enthusiasm for the unit this way: "It's got fast, easy controls, good visibility, and you can't 'stick' her. It's a darned good machine."

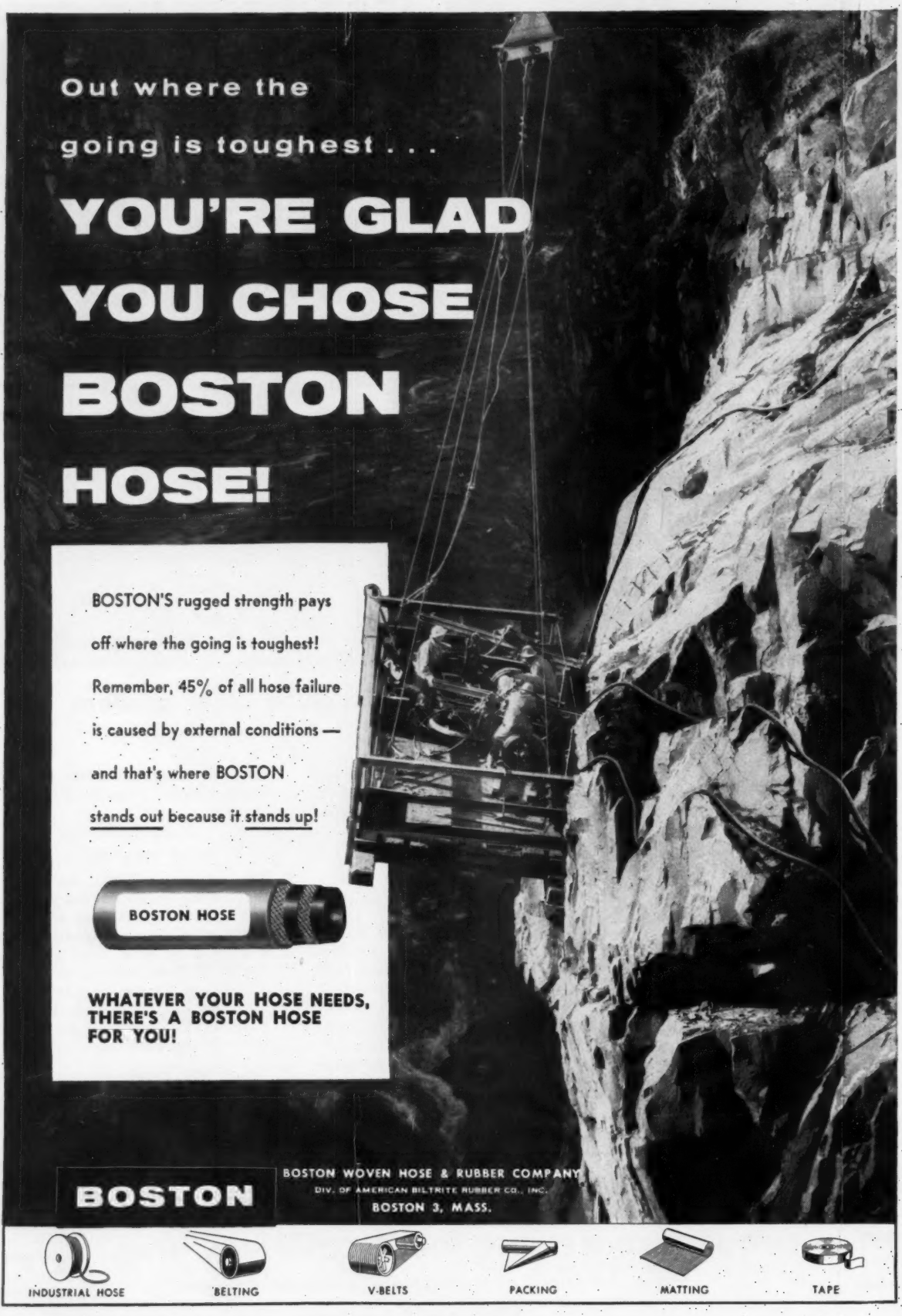
Before you choose another grader in the medium-sized range, merely because you've always owned 'em in that size, investigate the far greater work-power of the 190-hp Adams torque-converter POWER-*Flow*. It's the BIG grader, that handles ANY grading at low unit cost.

*Trademark G-1789-DCI-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit


Out where the
going is toughest . . .
YOU'RE GLAD
YOU CHOSE
BOSTON
HOSE!
BOSTON'S rugged strength pays off where the going is toughest! Remember, 45% of all hose failure is caused by external conditions — and that's where BOSTON stands out because it stands up!
BOSTON HOSE
WHATEVER YOUR HOSE NEEDS, THERE'S A BOSTON HOSE FOR YOU!
BOSTON
BOSTON WOVEN HOSE & RUBBER COMPANY
DIV. OF AMERICAN BILTRITE RUBBER CO., INC.
BOSTON 3, MASS.
INDUSTRIAL HOSE
BELTING
V-BELTS
PACKING
MATTING
TAPE

"D" on left spreads load in thin lifts to bring shoulders up to grade, on relocation of U.S. 6 near Victor, Iowa. "D" on right speeds back to borrow along road.

Two 9-yard scrapers speed completion of 4.5 miles of shouldering

On a 4.5-mile section of relocated U.S. Highway 6 near Victor, Iowa, Reilly Brothers Construction Company of Ossion, Iowa, used their two LeTourneau-Westinghouse 9-yd. D Tournapulls® on shouldering and finishing work — with these outstanding results.

Loads 6.5 yds. in 29 sec.

Push-loaded by an 85 hp crawler-tractor, "D's" loaded 6½ pay-yards of topsoil, clay and silt in 29 seconds. Hauling out of roadside or ditch borrow, rigs climbed steep grade onto roadbed. "D's" then hauled from 50′ to ½ mile on completed shoulder, to fill.

Returns at top speed over completed highway

After spreading material in shallow lift alongside concrete slab, "D" swings around in tight, continuous 180° turn, within 24′3″. "D's" returned to cut at top speed over completed highway, without damage to paving. This was possible because — in spite of its high production capacity — D Tournapull's weight is within legal 9-ton, axle-load limit. Fast return over slab really paid off for Reilly . . . enabled "D's" to cut cycle time down to barest minimum, to complete job in just 5 days!

"We like the 'D' "

With performance like this, Superintendent Robert Reilly said: "We like the 'D's' . . . especially that positive electric power-steer and no-slip differential. Helps a lot when the going gets sticky or slippery."

Travels job-to-job without special permit

Reilly sends his 29 mph D Tournapulls job-to-job, over highways, without the bother of obtaining special permits. D 'Pull* is only 8′ wide, and within legal weight limit. Operator is on his way at a moment's notice. There's no delay waiting for truck-trailer, loading, or unloading. Just get on and GO!

Get complete story

Why not see for yourself how this fast, 9-yd. D Tournapull can cut your cost-per-yard on small yardage and scattered dirtmoving assignments?

High ratio of horsepower to loaded weight takes D Tournapull quickly up steep grade.

D Tournapull is push-loaded with 6½ yds. of topsoil in roadside borrow. Note excellent visibility. Operator can easily see load and pusher.

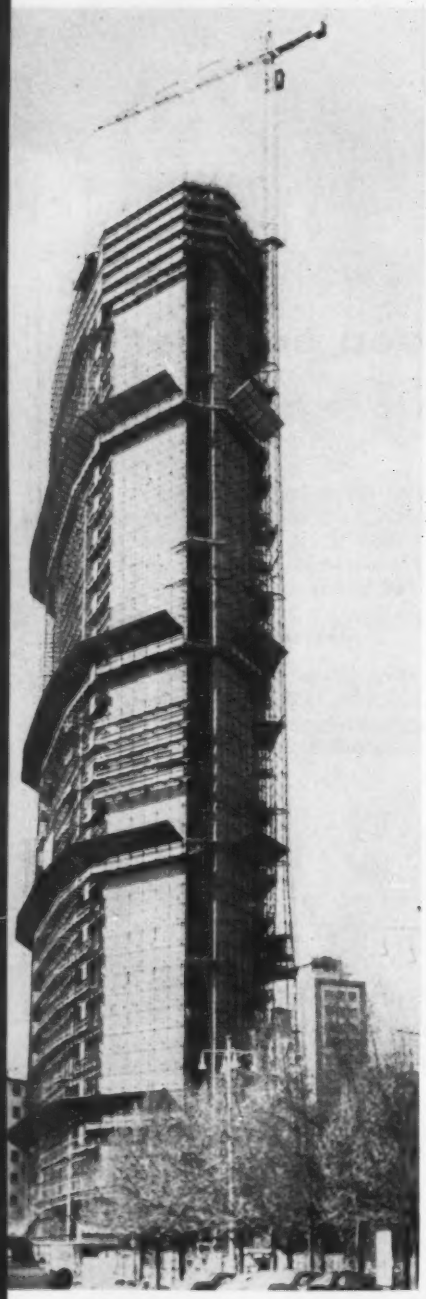
*Trademark DP-1838-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Construction 'Round the World . . .

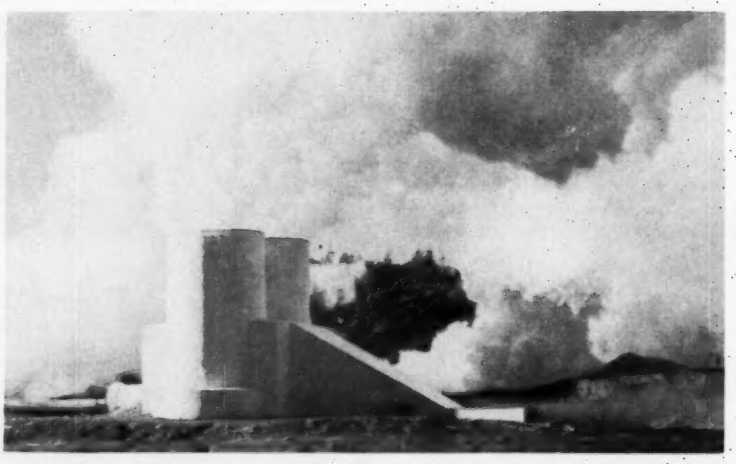


In Italy

A tower crane working on the Pirelli skyscraper in Milan mounts a boom that reaches the phenomenal height of 424 ft. The boom has to be secured to the building it helps erect, but its height easily sets a record. The 100-ton rig so far has lifted over 60,000 tons of building material in loads that rise at a rate of 182 ft. per min.

In Mexico

Rollers compact subbase before asphaltic concrete paving operations get under way on a 100-mph highway between Mexico City and the new industrial park area in Queretaro City. The $10-million speedway is expected to cut the driving time from Mexico City to Queretaro from 4 to 2 hr and shorten driving time to the U. S. border.



In New Zealand

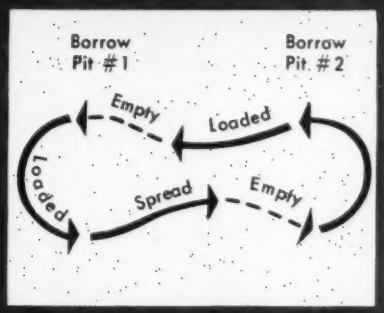
Two 61-ft-dia centrifugally spun reinforced concrete pipes mute high pitch noise caused by high pressure steam escaping from a geothermal power plant in Melbourne. Humes, Ltd., of New Zealand, chose concrete to muffle the screaming steam because the silencers had to cope with sudden expansion and high temperature.

HOW TO

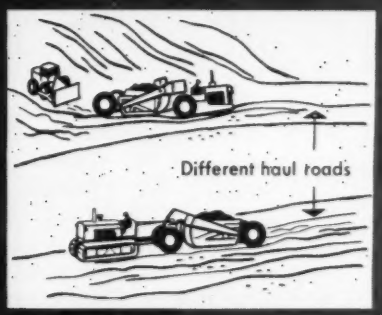
cut your cycle time for more yardage per shift

Here are six ways to take advantage of the speed of your rubber-tired, self-propelled scrapers . . . for more efficient, more profitable dirtmoving.

1. Plan job layout carefully. Keep haul routes as short as possible, with a minimum of turns. Often, it's possible to open cuts at either end of the fill (or fills at either end of your cut), to eliminate half of your turning. This makes an important saving if your pushers have time to load the faster scraper cycles. It also saves tires, fuel, and mechanical repairs . . . plus relieving haul-road congestion and passing slow-downs.

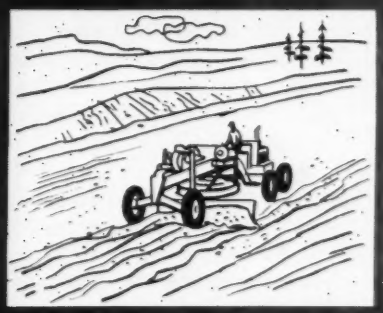


2. Team units according to speed. Whenever possible, work crawler-scrapers on one section of job, self-propelled scraper units on another. Or, at least, let them use different haul roads. This prevents passing delays for fast-hauling scrapers or slow-downs to speed of crawler units where passing is not possible.

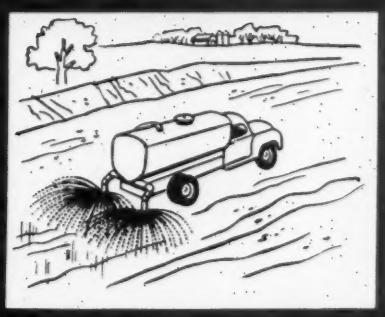


3. Check interval between scrapers. On haul and return, operators often tend to bunch up. In all cases, your scraper operator should hustle as much as possible to close a long gap between units . . . slow down when too close. Where two scrapers come onto cut together, load first guy a little short, give the second a maximum load. On dump, spread No. 1 short, send No. 2 to far end.

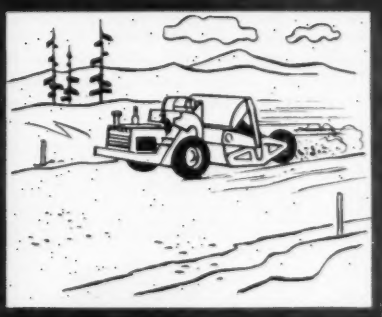
4. Maintain haul roads. Use a motor patrol (or dozer) to eliminate ruts and rough washboard surfaces, so your scrapers can travel at higher speeds. Grades should also be flattened as much as possible, to improve cycle time. Not only will this save time, and repairs, but it will increase safety and reduce operator fatigue.



5. Reduce dust with sprinklers. Use of sprinkler to keep haul roads moist (not wet) will permit higher travel speeds . . . cut down on dust for better visibility . . . and prevent excessive wear on your equipment.



6. Make full use of rubber-tired speed. On the fill, your operator should spread on the run in the highest gear possible. However, he should not hesitate to shift down as momentum is lost. Lugging the engine usually results in slower speed than top range of next lower gear. It's better to shift down and accelerate faster. In the cut, operator should not try to cram in the last cubic foot of dirt. Time spent here can be better used in high-speed travel, to increase number of loads delivered.



Another way to get more pay yards for less net cost is to modernize your equipment fleet. Get bigger-capacity production units, more speed and maneuverability.

Why not talk to your LeTourneau-Westinghouse Distributor . . . let him show you cost and production figures on modern 2b 18, and 9-yd Tournapulls®. Then compare with the output of less modern units of your fleet? 1857-DC-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

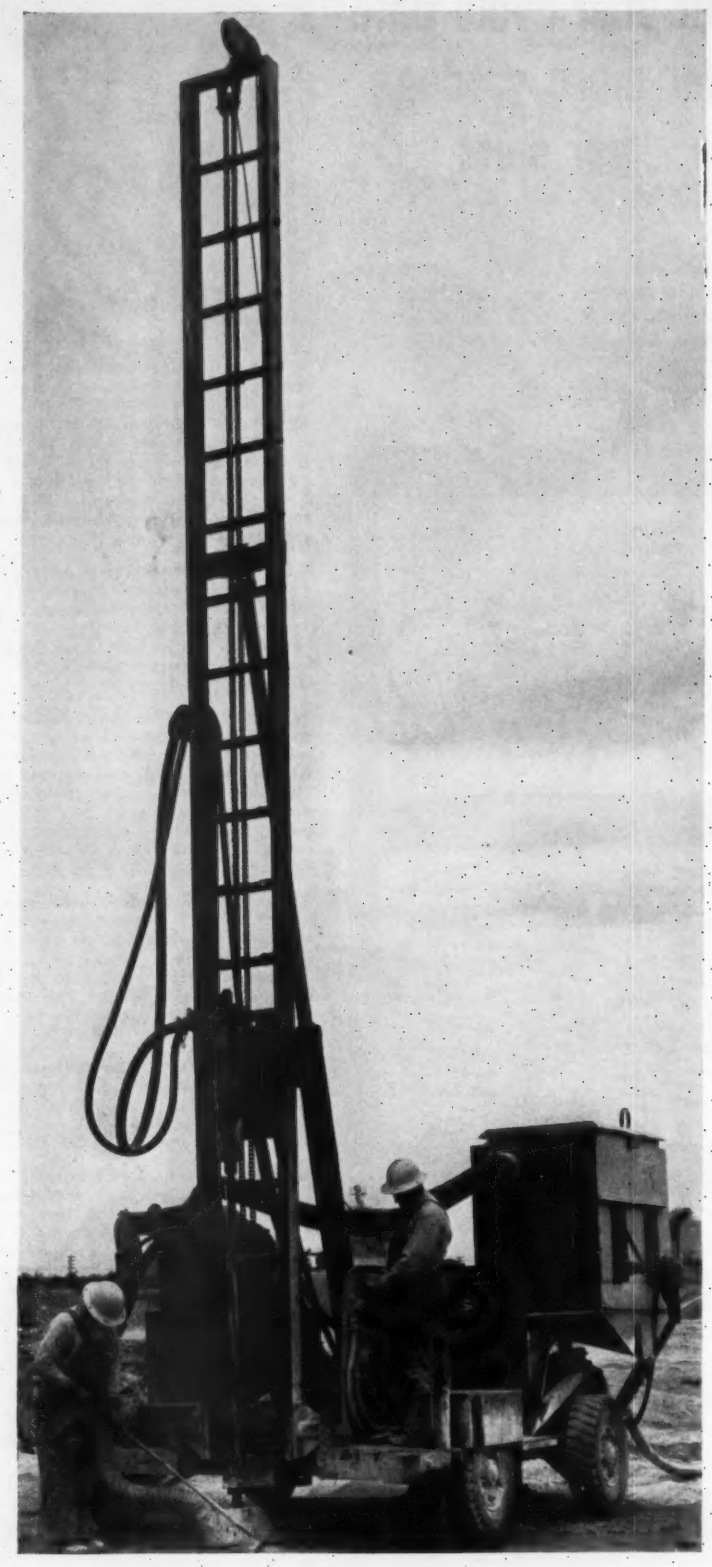
Where quality is a habit

Biting through 22 ft of Abrasive Limestone

This drilling rig, equipped with Bethlehem Hollow Drill Steel, is putting down 3½-in. diam blast holes as deep as 18 ft in a quarry at Bowmansville, N. Y., operated by Buffalo Crushed Stone Corp., a unit of Houdaille Industries, Inc. The limestone, for use in construction projects, is being drilled economically with 2-in. round Bethlehem Hollow, fitted with carbide-insert bits. Reconditioning is done by Niagara Bit and Drill Steel Corp., North Tonawanda, N.Y.

Any type of rock drilling, regardless of the type of formation, can be drilled with minimum breakage when you use Bethlehem Hollow. This is because it's rolled from a special fatigue-resistant steel. It has a uniformly round hole, centrally located in the bar, and a wide quenching range. It can be heat-treated easily for the proper balance of toughness and wear-resistance. The result: durable threads and shanks.

Bethlehem Hollow comes in Carbon and Ultra-Alloy grades in rounds, hexagons, and quarter-octagons. Standard lengths range from 18 to 27 ft. Longer lengths can also be supplied. Specify Bethlehem Hollow for your next rock drilling project.



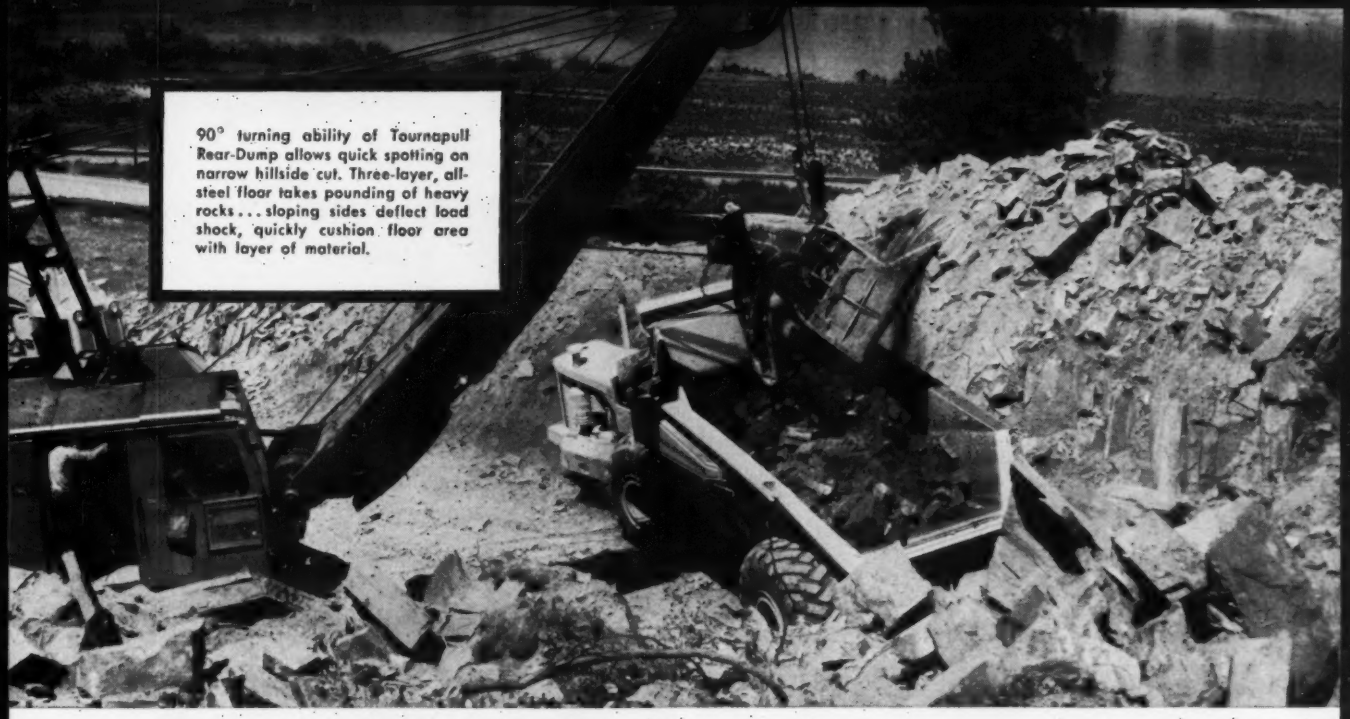
Drilling rig, equipped with Bethlehem Hollow Drill Steel, making blast holes at limestone quarry of Buffalo Crushed Stone Corp., Bowmansville, N. Y.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM HOLLOW DRILL STEEL CARBON AND ULTRA-ALLOY



90° turning ability of Tournapull Rear-Dump allows quick spotting on narrow hillside cut. Three-layer, all-steel floor takes pounding of heavy rocks . . . sloping sides deflect load shock, quickly cushion floor area with layer of material.

Here's a way to lick rock hauling problems...

On most construction projects, operating conditions are often uncertain. To assure yourself of continued high job-efficiency, your haulers must be able to work profitably despite unfavorable circumstances. That's why we think you should investigate the go-anywhere LeTourneau-Westinghouse Tournapull® Rear-Dump. This rugged hauler maneuvers easily in tight quarters . . . is quickly loaded . . . carries heavy loads over rough, soft, or slippery footing safely . . . and dumps fast and clean.

Here are the facts that back these important claims:

Greater maneuverability

Continuous 180° turn — within distance less than unit's own length — quickly positions Rear-Dump under dipper or at dump. Time normally wasted by conventional haulers jockeying back and forth to spot at shovel or dump is eliminated.

Hauls anywhere

Machine's big, low-pressure tires "float" machine over sand, mud, or other obstacles. Broad tire-lugs maintain traction in any type material. Power-transfer differential puts 80% of traction on drive wheel in firmer footing, when either powered wheel begins to spin. Electric pivot-turn, through geared kingpin, "walks" prime-mover out of soft spots.

Spreads or dumps fast

Flick of an electric switch actuates hoist-motor. Body lifts quickly to any desired angle, for spreading on the run . . . or for dumping over bank.

At full-dump position, bowl is low behind rear wheels, so dump is clean — doesn't "bury" wheels. Streamlined body sheds material readily.

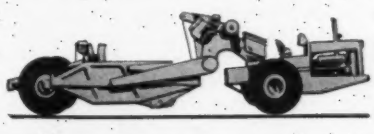
Maximum safety

Rear-Dump's multi-disc air brakes have more braking surface on a single wheel than most haulers have on all four. Front-wheel drive keeps power and traction on solid footing — well ahead of rear wheels — when dumping over high banks. And, low center of gravity, good visibility, power steer, easy electric controls . . . all contribute to operator's confidence and safety.

Increase your profits

Check the production advantages of LeTourneau-Westinghouse Tournapull Rear-Dumps. See how their maneuverability can speed your cycles, cut costs, and increase profits. 3 sizes: 11, 22, or 35 tons. Write or call for detailed information.

Converts to easy-loading scraper



When rock-hauling work is completed, you can interchange Rear-Dump trail-unit with an easy-loading scraper. You'll then have a double-duty tool, to help you earn bigger profits on all types of earthmoving. Scraper is available for less than ¼ the cost of original Tournapull hauler. Other useful specialized trail-units are available.

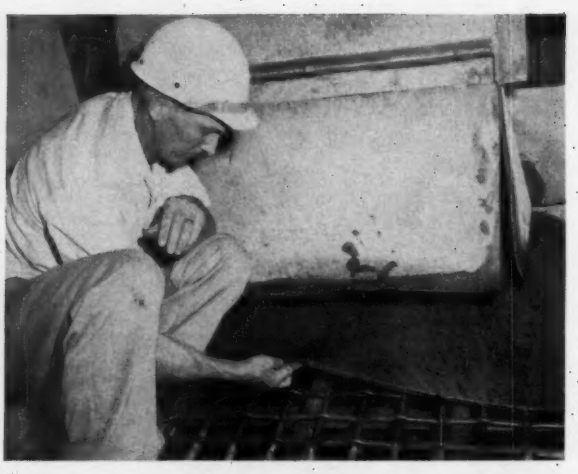
R-1820-DC-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

B.F.Goodrich



Tougher rubber keeps rocks on the run

B.F.Goodrich improvements in rubber brought extra savings

Problem: Thousands of tons of aggregate crash, skid and scrape through a big concrete plant every day. This terrific beating would soon wear out most materials, but concrete was needed to build a powerhouse and there wasn't time to wait for repairs.

What was done: To avoid costly delays, a B.F.Goodrich distributor suggested that a rubber called Armorite be used at points where wear was greatest. Armorite is specially compounded to stand this sort of a beating. This rubber is soft enough to *give* under the pounding it gets, yet so tough that it's even used in some places to carry broken glass.

Savings: Armorite, used to line a steel chute (upper left), has stood up under a daily 7000-ton avalanche of rocks for four months with no repairs or delays of any kind, is expected to last another year. It has given a wire-screen (upper right) five times longer life by protecting it from falling rock. It did a better job wiping the underside of a belt (lower left) than the steel belt scraper it replaced, and there's less danger of belt wear. Used as a flexible skirtboard centering the load on the belt (lower right), it prevents damage from rocks caught between skirt and belt, and lasts far longer than other materials.

Where to buy: Your B.F.Goodrich distributor has the exact specifications for the Armorite described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-428, Akron 18, Ohio.*

B.F.Goodrich *Armorite*

Construction Methods AND EQUIPMENT

SEPTEMBER, 1958

VOLUME 40 • NUMBER 9

HENRY T. PEREZ, Editor

Increasing Productivity

DURING THE PAST YEAR or so there have been several conferences on increasing highway engineering productivity. They have been jointly sponsored by the U. S. Bureau of Public Roads, state highway departments, associations of highway officials, and engineering schools.

Prominent contractors and representatives of the manufacturers of construction machinery participated in the conferences. And the one item for increasing productivity that these "men on the firing line" were in almost unanimous agreement about was the desirability of end-result-type specifications.

Too often the specification writer has usurped the contractor's prerogative of deciding how, and with what, he will attack certain phases of the job. In so doing, he is depriving himself of a measure of one of the contractor's greatest assets—ingenuity. Often both the method and result are spelled out in great detail. Then, when something goes wrong, there's a squabble over who's to blame and a hassle about proper payment.

In themselves, method-type specs are bad enough. But the situation is further fouled up by lack of specification uniformity from state to state. A contractor bidding two sections of road straddling a state boundary, for example, might require entirely different fleet units for each job. Or he might have to operate the same machines at different speeds or outputs. All this lowers productivity and increases costs.

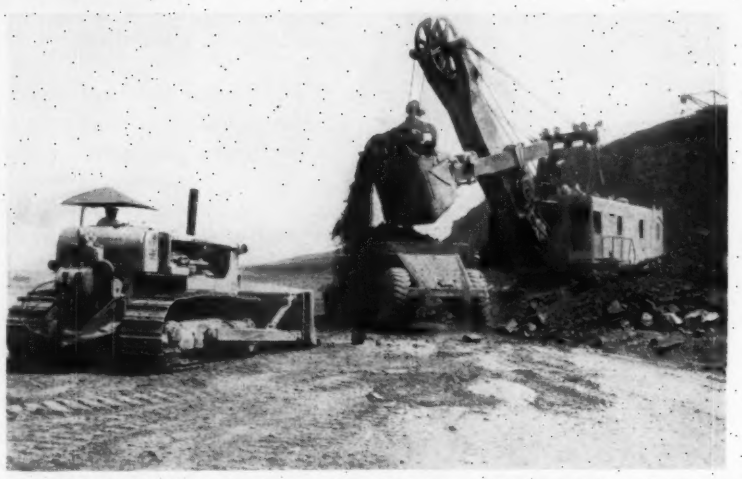
Then, too, such specifications tend to discourage the development and introduction of new types of construction machinery. What's good for one state highway department would seem to be bad for another. Uniform, result-type specifications would let contractors get maximum production from existing equipment and probably would result in newer, higher-production units.

Undoubtedly today's specifications were written with a sincere desire to insure the state or county getting the type of road it wants. But it will still get that road under improved specifications that let the contractor use his knowledge, imagination, and equipment to best advantage. It's the easiest way in the world to increase productivity—and thereby stretch the highway dollar.

BATTLEGROUND—Western launched the closure operation along a 600-ft front (1). Minutes after closure, equipment moved upstream to build a diversion dam (2).

Earthmovers

In a tense 21½-hr battle, a big fleet of heavy earthmovers thrust an earth dike across the Missouri River to make closure at the site of Oahe Dam—world's largest rolled earth dam. It was a smooth operation even though flood waters on the upper Missouri forced Western Contracting Corp. to move up the time schedule and put into effect an emergency plan to counter the high flow rate.



LOADING—A Marion 191-M shovel with a 13-yd dipper, digging against a 25-ft sheer face, loads a 25-yd Euclid bottom dump as a D9 stands by to keep the loading zone cleared.

IT TAKES skill and muscle to throw a dike across a flood-swollen major river with a straightforward earthmoving operation. Western Contracting Corp. showed plenty of both in making closure of the Missouri River at Oahe Dam near Pierre, S.D.

Project Manager Carl "Rip" Collins mustered one of the biggest fleets of earthmovers ever assembled for such a job. With these machines his men moved 67,000 cu yd of shale down an 8,500-ft haul road in one tense 21½-hr period.

Western didn't bother with a lot of elaborate preparation for the closure. There was only a minimum of stockpiling and no selected material for the job. All of the fill was dumped as it was removed from the inlet channel of the outlet works. Western received no extra payment for diversion; they got only their regular rate for dirt in place under the 24,500,000-yd, $8.9-million Stage 6 earthwork contract that included diversion.

In readiness for the final push, Collins' crew narrowed the channel to 125 ft along a 600-ft front at the downstream edge of the dam. Engineering calculations showed that a trench 600 ft long would present enough surface roughness to rob the waters of their destructive energy.

The entire operation was planned pretty much as just another day's work—until the Missouri turned tricky at the last moment. Four inches of rain in the Black Hills of South Dakota sent water racing down the Cheyenne River into the Missouri and raised its flow rate from 7,000 cfs to an unexpected 8,800 cfs. This meant that a crest of 12,000 cfs would hit the dam about the time the closure operation reached its critical point.

Western and the Army Engineers agreed upon their countermove at a hastily summoned midnight conference. They pushed the timetable ahead 12 hr—to 6 am, August 2—so the river could be plugged before high water hit. Next, they ordered into effect a contingency plan prepared for just such an emergency. Equipment was routed to the downstream edge of the embankment to build a 300-ft-long earthen training dike, or "tiger tail," onto the downstream end of the 600-ft section. This increased the channel length from 600 ft to 900 ft and offered a greater surface

Plug a Raging Missouri River

THE RIVER FIGHTS BACK—As the gap narrows, the normally sluggish river becomes a turbulent, fast-flowing stream. During the 6-hr critical period a truck was dumping every 20 sec, but the rapid current carried away one truckload of every three that was dumped.

friction to dissipate the water's energy.

Then began the battle to see whether Western's earthmovers could load, haul, and dump shale fill faster than the river could carry it away.

At the excavation site were three adjacent loading areas. Two Marion 191-M electric shovels with 13-yd dippers worked 25-ft vertical faces of shale. A Marion 191 dragline with a 14-yd bucket worked a flat bench above the shovels, and a 151 dragline with an 8-yd bucket stood by.

All three loading zones had been cleared of overburden and shot lightly with powder. This produced large pieces of shale and enabled fast loading. The specs required a breaking method such that all pieces would be at least 8 in. and at least 35% would be 15 in. or larger.

Twenty Euclid end-dump trucks of 35-yd capacity and 10 Euclid 25-yd bottom dumps did the hauling. These trucks averaged 3,200 cu yd per hr; in their peak hour they moved 3,800 yd. So closely was the load-haul-dump cycle timed that a Euc was dumping a load of rock at the river's edge every 20 seconds.

Conspicuous by its absence from the line was "Eucnik," Western's huge earthmover. This 80-cu-yd end dump blew the bottom cap off its hydraulic cylinder while dumping its first load. It was benched for the rest of the job.

Four Caterpillar D9 bulldozers shoved the rock into the channel as fast as it was dumped. Three other D9s kept the loading zones cleared so trucks would not be delayed. The haul roads required constant attention from six 6,000-gal Euclid water trucks.

EMERGENCY MEASURE—To meet the unexpectedly high flow rate, Western built a 300-ft dike, or tiger tail, onto the downstream end of the closure section. The longer channel provided more surface friction to rob the waters of their destructive energy.

EARTHMOVERS PLUG THE MISSOURI . . . continued

and eight Caterpillar No. 12 motor graders to withstand the terrific punishment they received.

The natural soil at the site of the closure was river sand. So there was the constant threat that as fill was shoved in from the right bank the river would retreat by slicing away sand from the opposite side. To avert such a chase, Western stockpiled 12,000 yd of shale along the left bank of the stream. Four D9 bulldozers were assigned to replace erosion losses and pin the river in place.

But the Missouri kept the dozers idle and helped beat itself. As the channel narrowed, the river undercut the left bank and dropped the stockpiled rock into place to prevent further erosion. The Cats did not move a track, and Western was happy to keep them idle; working the undercut shale could have been a ticklish job for the machines.

Throughout the closure operation the work moved with a routine smoothness which belied its urgency. Careful layout of haul roads and strategic spotting of equipment and fill material helped coordinate this effort. Despite their close timing, the haul trucks avoided tangling up by moving in an orderly dumping pattern that sent the end dumps to one area on the closure block and bottom dumps to another.

Through the day and into the night the fight continued. As the gap grew small the velocity of the stream increased, and progress slowed noticeably. During the 6-hr critical period, water was flowing 18 to 20 ft deep at a speed of 20 mph; and the Missouri picked up one truckload of every three dumped and carried it downstream.

But foot by foot the embankment crept toward the opposite shore. Finally, after 21½ hours, the two sides of the channel touched, the Missouri turned back defeated, and Oahe Lake was born. It was 3:35, Sunday morning.

Within minutes, equipment was on its way upstream to begin building a diversion dam at the upper edge of the embankment. Six D9's, three on each side of the river, began dozing material into the 200-ft breach; 15 end dumps kept them supplied with fill. By 9:30 Sunday morning the second dike was completed.

Even before the diversion dam was finished, a dragline with an 8-yd bucket began digging a ditch across the first closure plug. When the upstream dike rose above water level, this ditch was opened to drain the water trapped between the upstream and downstream barriers.

Diversion of a river before closure generally aids the contractor because it reduces the head against which he must work. In this case, however, the Missouri's waters could not be diverted until after closure.

Water is carried from Oahe Lake to a point downstream by six flood control tunnels in the right abutment of the dam. These tubes, each 19 ft in dia and 3,500 ft long, are set high and on a bias. The first tunnel did not carry water until the river stage rose 10 ft; the others came successively into use in 6-ft increments as the pool became deeper. Eventually the pool will grow into a lake 200 ft deep and 250 mi long—a reservoir holding 23,500,000 acre-ft of water at maximum storage.

Collins had at his command $10 million in earthmoving equipment for the closure of Oahe Dam. This may seem excessive for the $8.9 million Stage 6 earthwork contract that Western currently holds. But the immense fleet of equipment was already on the Oahe job.

Western has been awarded enough work on the Oahe Dam—five of the eight prime earthwork contracts let in the past seven years—to make such wide use of equipment economical. These $29 million in contracts called for excavating 77,000,000 cu yd of shale and cover, and placing 61,000,000 cu yd of embankment. Western Contracting Corp. has averaged 100,000 cu yd of excavation per day under its present contract by working two 10-hr shifts each day in a six-day week.

Oahe Dam—the world's larg-

FINAL PUSH—with the plug nearly completed, engineers and supervisors watch a 35-yd Euclid dump one of the last few truckloads.

CLOSURE—Two heavy-duty Caterpillar bulldozers, one from the east bank and the other from the west, meet atop the closure plug.

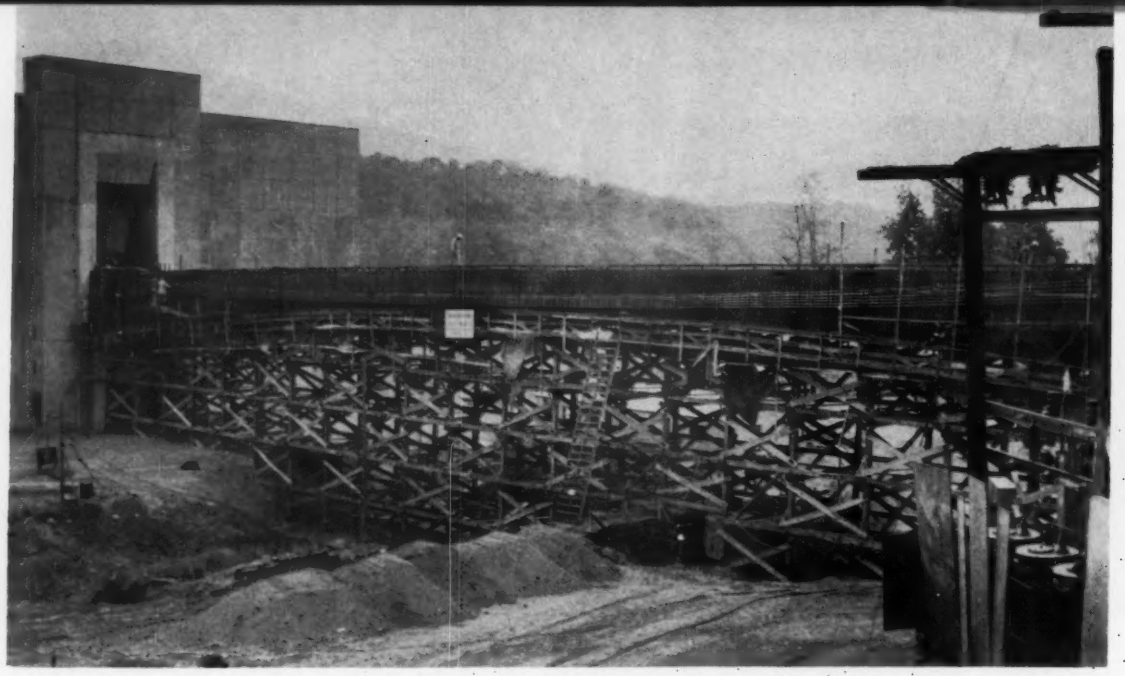
est rolled earth dam—will cost $380 million. Its massive 91,000,000-cu-yd embankment will be 9,300 ft long and will rise to a height of 242 ft above riverbottom; at its base it will be nearly 1 mi thick.

The dam, just above Pierre, S.D., is being built for flood control and hydroelectric power.

Construction of Oahe Dam is under the Omaha District of Army Engineers, directed by Col. David G. Hammond. The Oahe area engineer in charge is John Sibert.

Collins is project chief for Western Contracting Corp.. His general superintendent is A. Blackwell, and L. Garland Everist is construction manager.

THE NEXT DAY—In the foreground is the closure plug crossed by a ditch that is draining the entrapped water. Remains of the tiger tail are still visible at the downstream edge of the closure plug. Upstream is the diversion dam, with Oahe Lake forming behind it.



RECORD SPAN—Bridge across canal that runs alongside the Potomac River provides access to pumping station at Little Falls, Md.

Long Post-Tensioned Bridge

A PRESTRESSED BRIDGE now under construction at Little Falls, Md., will be the longest counterweighted, continuously post-tensioned bridge in the United States. It spans 216 ft between piers, and its total length, including counterweights at each end, is 281 ft.

For contractor James B. McHugh of Chicago, construction of the bridge is a challenging job. Formwork, placing concrete, and applying the prestressing force to the tendons all require careful workmanship.

The bridge, part of a $4.5-million water supply project for Washington, D. C., spans a canal that runs alongside the river and provides access to a pumping station on the river bank. The bridge connects the pumping station with an electrical sub-station on the other side of the canal.

The access road runs right through the middle of the substation, jumps the canal on the bridge, and ends at the door of the pumping station. The buildings at each end of the bridge give it an unusual apperance—somewhat like the moat-spanning drawbridges of medieval times.

The buildings house the massive concrete counterweights at each end of the bridge. Length of the required clear span, which provides for future construction of a dual-lane highway on each side of the canal, ruled out a simple beam type structure. The counterweights, which weigh around 700 tons apiece, take the place of anchor spans in balancing the dead load of the bridge.

The bridge is a box section 17 ft, 6 in. wide and varying in depth from 12 ft at the piers to 7 ft at midspan. A 16-in.-wide girder runs along each side of the box. Concrete slabs form the top and bottom of the box section.

Fifteen tendons apply the prestressing force to each girder. Each tendon is made up of twenty-five ¼-in.-dia wires. Tendons are enclosed in 2-in.-dia galvanized metal hoses.

Falsework

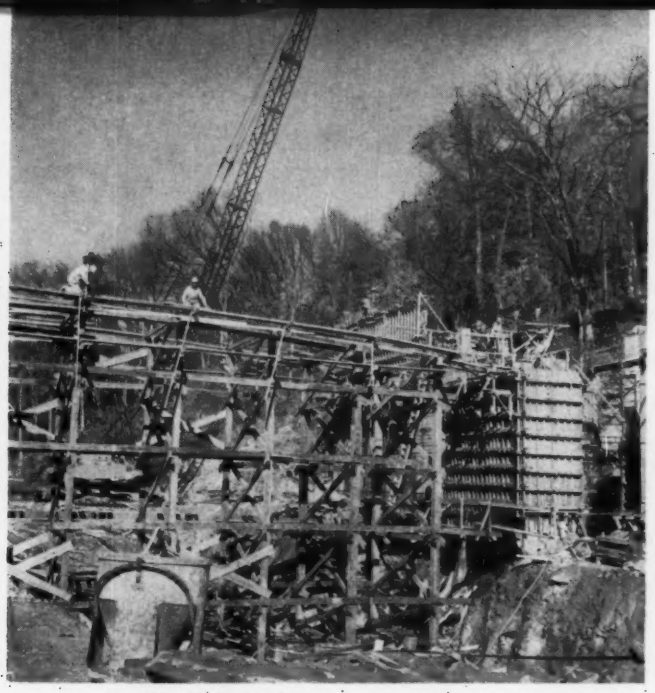
Erection of an extensive falsework system to carry the formwork for the box girder was the first step in construction. The 22 bents, spaced at intervals of about 10 ft, each consist of two 8x8 posts connected and braced by 3x8's. The posts rest on the concrete encasement of a 110-in.-dia conduit which runs underneath the canal on the same line as the bridge. The conduit also provides a ready-made footing for the two bridge piers, which are independent of the buildings even though they fit into the walls.

To allow movement of the falsework when the bridge contracts under the stressing load, holes for the ¾-in. bolts at all connections are slotted to make a 3x1-in. rectangular opening.

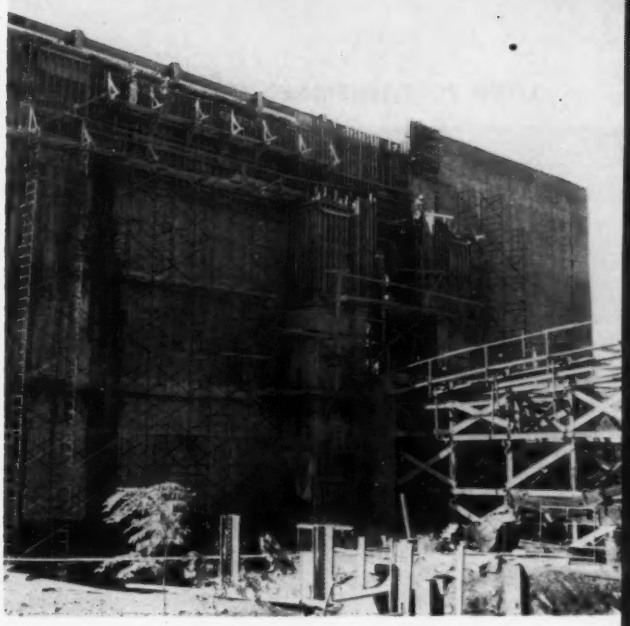
Formwork for the girders and slabs of the box section are supported by jacks at the top of the posts. This arrangement allows stripping of all girder formwork before decentering, another requirement of the specs.

A steel strap fashioned into a yoke and welded to the metal column cap at the top of each post holds a 20-ton, Duff-Norton screw jack securely in position. The head of the jack fits into a short segment of 4-in.-dia pipe welded to a piece of channel section attached underneath the double 4x6 cross-piece at the top of each bent. Because the diameter of the pipe is larger than the head of the jack, there is clearance for movement without danger of the jack toppling out of position.

Three heavy timber stringers span between cross-pieces on each side of the bents and hold the girder soffit forms, which are plywood. Spanall adjustable trusses span between the interior pair of heavy timber beams at 44-in. centers to support plywood for the bottom slab of the box.



FALSEWORK—Workmen place double row of stringers along top of 8x8 posts to link 22 bents in heavily braced falsework system.



PIER—Buildings at each end of bridge house massive counterweights. Abutment piers stand in recesses set into the walls.

Spans 216 Ft

Formwork for the top deck slab is also held by Spanalls, in this case supported by the heavily braced side forms for the twin girders.

A second double 4x6 crosspiece runs just below the top of the posts and extends out beyond either side to support walkways along the outside of the girders.

Concreting

McHugh worked from the bottom up in pouring the box girder superstructure of the bridge: First the bottom slab, then the girders on either side, and finally the deck slab. All pours were continuous, and they had to be fast. Specs didn't allow use of a retarding agent, so concrete crews had to move quickly to keep concrete from setting up before the entire pour was completed.

Two cranes—one at each end of the bridge—handled the ½-yd buckets that carried concrete to the forms. Three Mack trucks hauled two 4-yd batches at a time from the nearby Butler concrete plant. Crews started pours at the ends of the bridge and progressed toward the center, where a 16-in.-wide gap was left open to allow for shrinkage of the concrete.

Before pouring the concrete in the girders, workmen carefully positioned each of the prestressing tendons. Unistrut channel supports bolted to the bottom of the form at frequent intervals hold the metal enclosures through which the prestressing wires are strung. Marks drawn on the girder forms help locate the center of each tendon in exact position. Three brackets on each of the five levels of the channel supports hold tendons in each girder.

Formwork

The counterweights at each end of the bridge posed a tricky problem in forming for McHugh. Clearance between the sides of the counterweights and the concrete walls enclosing them is limited to only 3 in. in most places. Forms have to be pulled to leave this space open for unimpeded movement of the counterweights when the completed bridge is under load. Problem was how to get the forms out of the narrow slot.

Job superintendent Roy Stickny handled the problem with a form consisting of three parts: a ¾-in. plywood sheeting for the face, a wooden latticework backing up the form, and, in between, a pair of tapered wood strips to wedge the units tightly in place. One of the tapered strips is attached to a length of 1x1-in. angle with wood screws. The other, cut to the opposite taper, fits into the slot between the plywood sheeting and the strip reinforced by the angle.

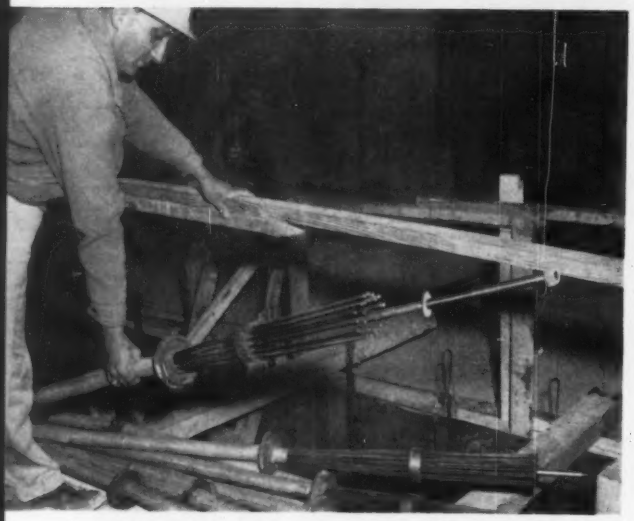
Axle grease lubricates the butt edges of the strips; the angle can be pulled out easily to strip the forms. The angle reinforces the tapered wedge enough to prevent splintering or sticking of the strip in the narrow slot during stripping. The wedge strips are spaced at 1-ft 9-in. centers along the length of the form. The latticework backing up the form is made of 1x2's on 24-in. centers.

Another forming problem—separating the base of the counterweights from the concrete slab underneath—was taken care of handily by laying a sheet of Visqueen plastic film over a sand cushion placed on top of the slab. The sand cushion temporarily supports the counterweights during construction.

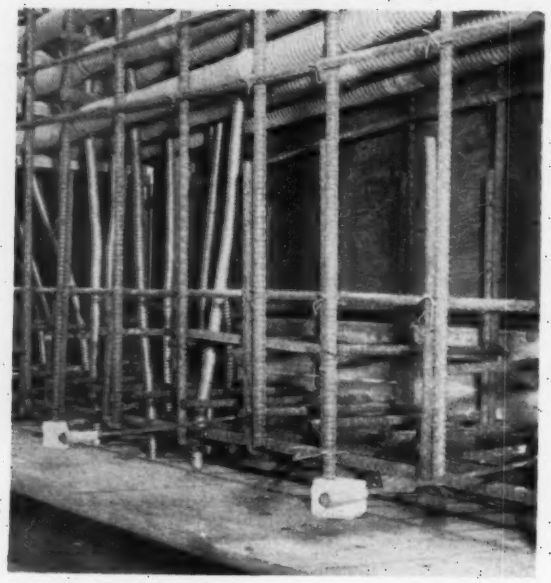
Prestressing

Most painstaking, and by far most critical, operation in construction of the bridge is prestressing of the steel tendons. Subcontractor on this part of the job is Prestressing, Inc., of San Antonio, Tex. The system they use is called the P. I. Method.

Two beads at each end of the wires—one for jacking and one for anchoring—distinguish the system from others. A special attachment on the head of the jack



ANCHORAGE—Beads at ends of the 1/4-in. prestressing wires anchor tendons against bearing plate and provide grip for jacks.



TENDONS—Unistrut channels bolted to bottom of forms hold the 15 tendons in each girder exactly in position during concrete pour.

grips the exterior bead. Interlocking washers backed up by shims hold the interior bead against the bearing plate to anchor the tendon.

Two Greenlee hydraulic jacks —one at each end of the girder— apply the prestressing force to one tendon at a time. Difference in stress between the girders must not exceed the force exerted by one tendon.

The anchorage assemblies are exposed in small unpoured pockets at the corners of the counterweights. Final pour in completion of the bridge is filling these pockets to embed the anchorages. To overcome friction between the wires and the metal enclosure, the jacks overstress each tendon a small amount before reducing the stress to the final anchorage stress.

Prestressing is accomplished in three carefully planned stages. First two tendons near the center of each girder are stressed. This imparts 10% of the final prestress to the bridge.

Next the tendons along the vertical edges of each girder are stressed, and the originally stressed tendons are restressed to bring them back up to their final anchorage tension. This stage involves jacking on 24 out of the total of 30 tendons. It is the big jump; it imparts 80% of the final prestress.

In the final stage, the three remaining tendons in the center row are stressed to complete the jacking operation. Average final stress at the anchorages is 150,000 psi in each wire. The jacks exert a maximum momentary force of about 115 tons in creating this tension.

Specifications drawn up by the Army Corps of Engineers, who are supervising construction of the project, list a number of preparatory steps which must be carried out satisfactorily before stressing progresses from one stage to the next. Before starting the initial stressing, the shrinkage control joint left in the center of the bridge must be poured. The concrete filling this gap is allowed at least 24 hr to harden before stressing of the first tendon.

After the first stage of jacking, actual stress readings from strain gages on the tendons are compared with theoretical values based on the force exerted by the jacks as indicated by calibrated pressure gages. This permits adjusting the friction and wobble factors in the stressing formula.

Before second stage stressing can begin, all girder and slab formwork is stripped, but without decentering the falsework. Concrete must reach design strength of 3,750 psi so there is a delay of about two weeks.

Application of the second stage of stressing may lift the superstructure slightly off the falsework at the center of the span. Whether or not this occurs, falsework is decentered before the third and final stage of stressing. But first it is important to make sure that the stressing force has actually shortened the bridge by 3/8 in. Then the jacks are lowered progressively from the center toward both ends simultaneously. The amount of lowering varies in a straight line from 1/4 in. at the center to zero at the ends.

In addition, at this point the sand cushion temporarily supporting each counterweight must be flushed out to leave the counterweights hanging freely in their enclosures. On the one end, where access to the narrow slot between the bottom of the counterweight and the concrete slab in the substructure of the building is limited to a little over 1 ft, this is a tough job. A workman has to lie down in the constricted space to inch forward the hose that jets out the sand.

Final step in construction of the prestressed box girder is grouting of the wires within the metal enclosures. With the vent pipes inserted in each enclosure open, grout is pumped into the enclosure from one end. When grout flows freely from the vents, the exhaust openings are closed, and grouting pressure is increased to refusal.

Construction of the bridge is scheduled for completion this month. In over-all charge for the Corps of Engineers is Area Engineer Samuel E. Neely. Calvin R. Burke is project engineer, Col. George B. Sumner is District Engineer, Washington District.

It works like an electric cake mixer, but this German-made rig can spew out well-proportioned, 18-cu-ft batches of hard-to-mix lightweight concrete rapidly.

BATCH DUMPS—Workman stands on Eirich Mixer work platform and cranks open discharge gate at bottom of mix bowl.

German Mixer Batches Lightweight Concrete

CONTRACTORS who work with lightweight insulated concrete consider their operations sound if they can place an average of 8,000 sq ft of roof deck daily. If one of them can increase this daily average by 2,000 sq ft with the same size crew, he's got a slick operation.

That's the rate one contractor, Peralex of New Jersey, is placing roof deck on an 80,000-sq-ft deck job at Lenape Regional High School in Medford, N. J. Peralex, a manufacturer of Perlite lightweight aggregate, is doing the roof work on this job. Reason for the high production, Peralex says, is a novel German concrete mixer called the Eirich Mixer.

The machine works like an electric cake mixer, spewing out well-proportioned, 18-cu ft batches of the hard-to-mix lightweight concrete in rapid 2-min cycles.

Slabs on the Lenape job are 2½ in. thick. Most of them go over corrugated metal forms tack welded over open web joists on 2½-ft centers. Only reinforcing is 4x8-12/14 welded wire mesh. A small area of slab goes over insulation board placed on bulb T's that connect structural steel.

Peralex mounts the German mixer on the ground in the center of the U-shaped school building. This leaves it within easy reach of a Lorain crane that buckets the concrete batches to the roof deck. Only two or three moves by the mixer will be needed throughout the job.

The mixer has a cable-pulled skip that moves up two tracks to discharge its contents into the mixing bowl. One workman empties a 4-cu yd sack of Peralex, a lightweight aggregate with a Perlite base, into the skip. (Perlite is an expanded volcanic material.)

The workman then dumps in a bag of high-early-strength cement. Ratio of the mix is 6 Peralex to 1 cement by volume. The machine operator next moves the skip up the track where it discharges into a shallow, round, flat-bottomed mixing bowl. There, water and a special wetting and air-entraining agent are added.

The mixing process is unique. Three paddles at different fixed radii rotate clockwise on a vertical shaft while the bowl itself rotates counter-clockwise. This thoroughly mixes a batch without overcompacting the lightweight aggregate.

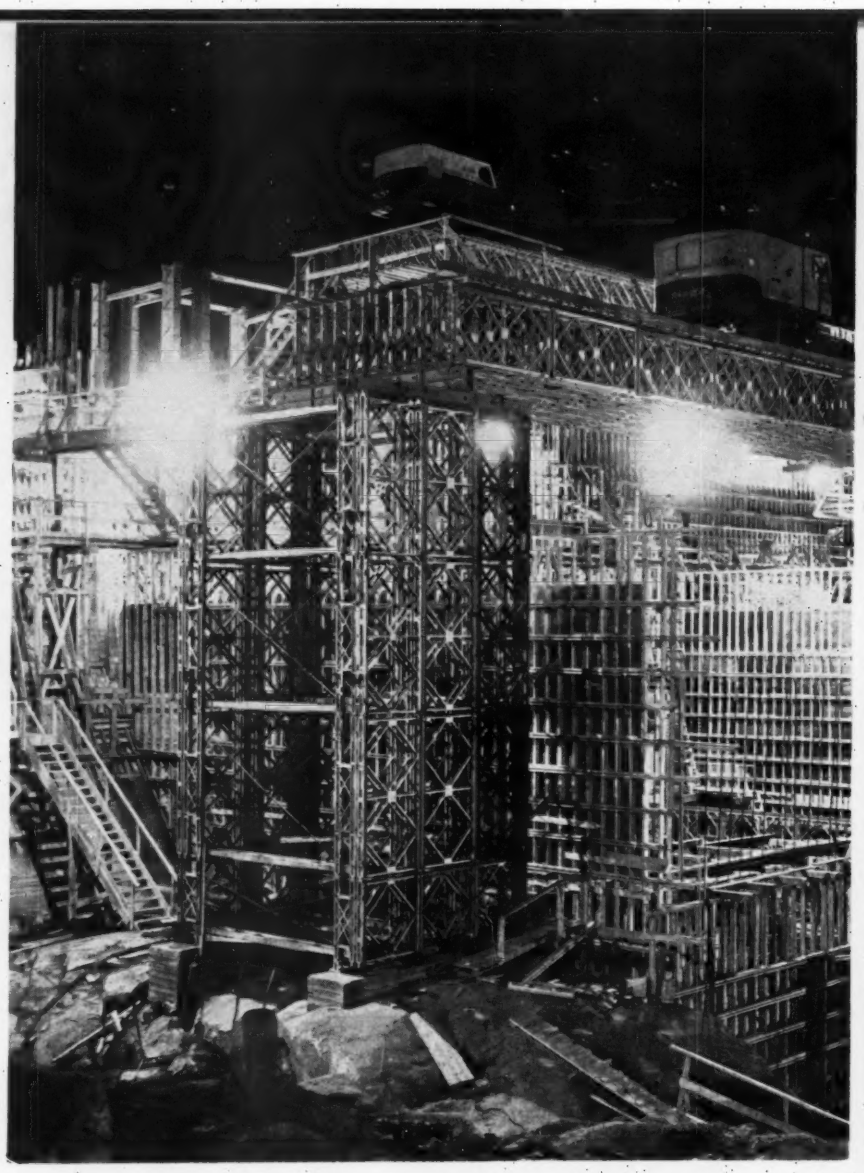
Mixing is continued until specified strength and density are reached. For this job, specifications call for a lightweight concrete that attains a 300-psi strength in 28 days with a maximum density of 35 lb per cu ft.

The batch is discharged through the bottom of the mixing bowl and into a chute that carries it to the waiting crane. The crane's bucket deposits the concrete on a deck where it is quickly spread, straight-edged, and dobbied.

INTO BUCKET — Lightweight concrete pours down chute into bucket that crane will carry to roof deck for spreading.

SPECIAL REPORT:

Bailey bridging, a brilliant wartime invention, is equally successful as a construction tool—and much more versatile. The soldiers who build the bridge over the Caen Canal in 1944 (below) would be amazed to see the same equipment today carrying a 65-ton crane over the formwork on a big dam.

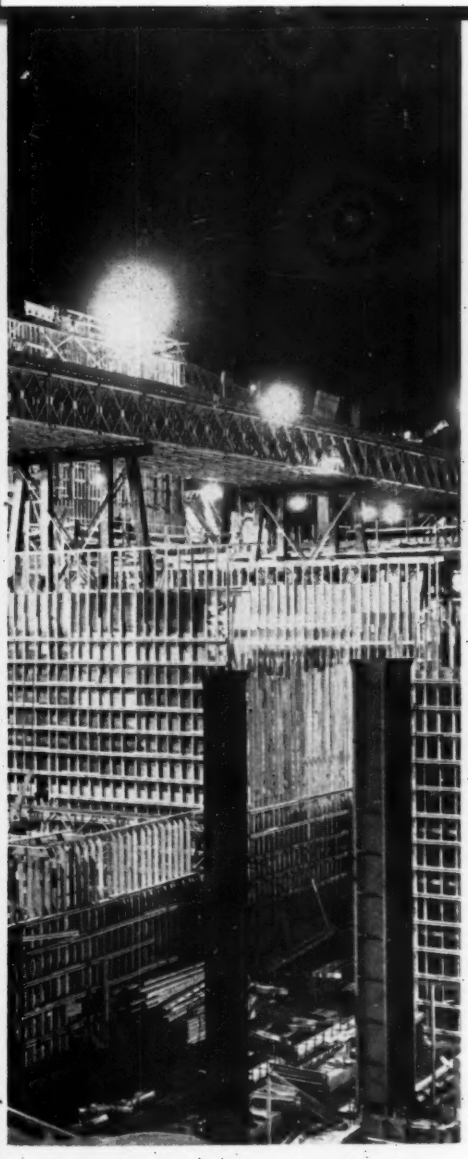


Bailey

By JAMES G. RIPLEY,
Assistant Editor

DURING THE INVASION of Europe in World War II, an American war correspondent watched a Bailey bridge open the way for a dramatic last-minute rescue of an infantry detachment.

He reported how the American infantry, advancing towards Cologne, became trapped on a precarious bridgehead over the Erft Canal. Engineers worked feverishly under fire to push the Bailey



Bridging

across the canal so reinforcements could cross. In a matter of hours they succeeded, and an armored column crossed the canal to save the bridgehead.

The correspondent emphasized the key role of Bailey bridging in the Allied advance, quoting Field Marshal Montgomery, who said it was "quite the best thing of its kind we have ever had."

EDITORS NOTE

This is the first of a two-part special report. The second half of the report will appear in the November issue.

He ended his story by saying that no one saw a bright future for the bridge after the war. His judgment of the Bailey contribution to the war effort was correct. But his pessimistic prediction for the future has turned out to be entirely incorrect.

The Bailey bridge, in fact, had little trouble adjusting to civilian life. Its first big role after the war was as semi-permanent bridging in war-damaged Europe, where steel was scarce and there were many gaps to span.

Steel was still scarce in North America, too, and an enterprising Canadian outfit bought up surplus Bailey material to use for steel building trusses, rather than wait for steel mills to turn out new structural steel.

A number of local governments figured the Bailey would be a great thing to have on hand in case of floods or other disasters. So much of the surplus found its way into highway department stockpiles.

Contractors were slower to realize the potential of Bailey units in construction. But a few of the larger ones laid in a supply and developed some ingenious uses for it. Gradually it has become accepted as an effective, though specialized, construction tool.

For those not familiar with Bailey parts, the easiest way to visualize them is as they fit into a bridge.

The Bailey bridge is basically a through-truss type, prefabricated steel bridge. The secret of its versatility is that it is made up of a very few standard, interchangeable units. With these units, a builder can erect any shape or size of bridge, much as a boy builds various model structures with an "Erector" or "Mechano" set.

The most important unit is the panel—a 5x10-ft steel truss section that can be pin-connected to similar sections to form a continuous girder. Two such rows of panels, connected by cross-beams or "transoms," form the simplest possible Bailey bridge.

As many as three trusses can be built side by side to form a box-type girder and increase the capacity of the bridge. And the capacity is further increased by building up to three rows or stories on top of each other.

A Bailey bridge is classified by the number of panels in the truss, including first the number that are side by side, then the number of stories. Thus a "double-single" bridge contains (in each truss) two rows of panels side by side. A "triple-triple" (the heaviest type normally used) contains three rows of panels in each row and is three panels high.

Since 1950, an English manufacturer has been producing Bailey material for the civilian market, and nearly half his output goes to construction companies. So far Bailey equipment, including numerous refinements that gradually have been added, has performed an astonishing variety of construction roles.

It has made a significant contribution to the construction industry—far beyond anything that could have been imagined by the inventor, an English engineer, Sir Donald Bailey, who devised it for a rather specialized military function.

The construction role is likely to grow as contractors find out what Bailey equipment can do.

To help contractors appraise Bailey bridging as a construction tool, *Construction Methods* has collected examples of Bailey units handling various types of jobs around the world. We have grouped them under the following headings:

- **Bridges.** The biggest percentage of Bailey equipment is still in bridges, mostly on highway work, but also on any job where it is necessary to divert traffic, or where access is a problem.
- **Bridge Erection.** Some of the most ingenious applications of Bailey have been as scaffolding, falsework, or gantries in the construction of permanent bridges.
- **Dams.** The biggest non-bridging use for Bailey equipment has been in large-scale dam construction, for such jobs as formwork, conveyors, and even temporary construction buildings.
- **Buildings and Miscellaneous Structures.** This is a more limited outlet for Bailey material, but in certain cases, Bailey has proved its value.

To complete the picture we have included two sections on Bailey equipment in general:

- **Technical description.** This includes details of the basic parts and an outline of recent improvements.
- **The Market.** How the business developed, the current marketing situation, including prices and delivery costs.

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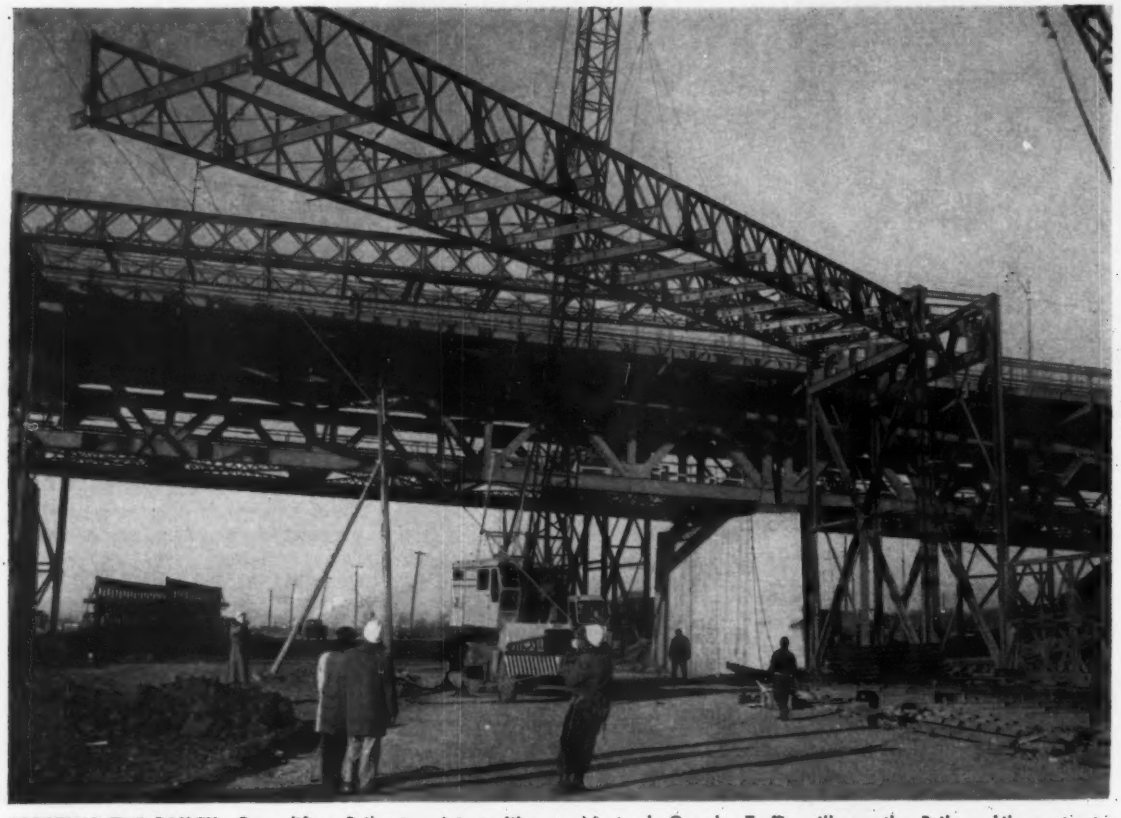


ERECTING THE BAILEY—Crane lifts a Bailey truss into position on steel bents alongside approach to Jacques Cartier Bridge in Montreal, Canada. Traffic will use the Bailey while contractor raises main bridge to clear channel of the St. Lawrence Seaway.

Bypass Baileys Keep Traffic Moving

USING THE BAILEY—Northbound car on two-lane Bailey bridge bypasses construction work on main bridge. Similar structure on other side carries southbound traffic.

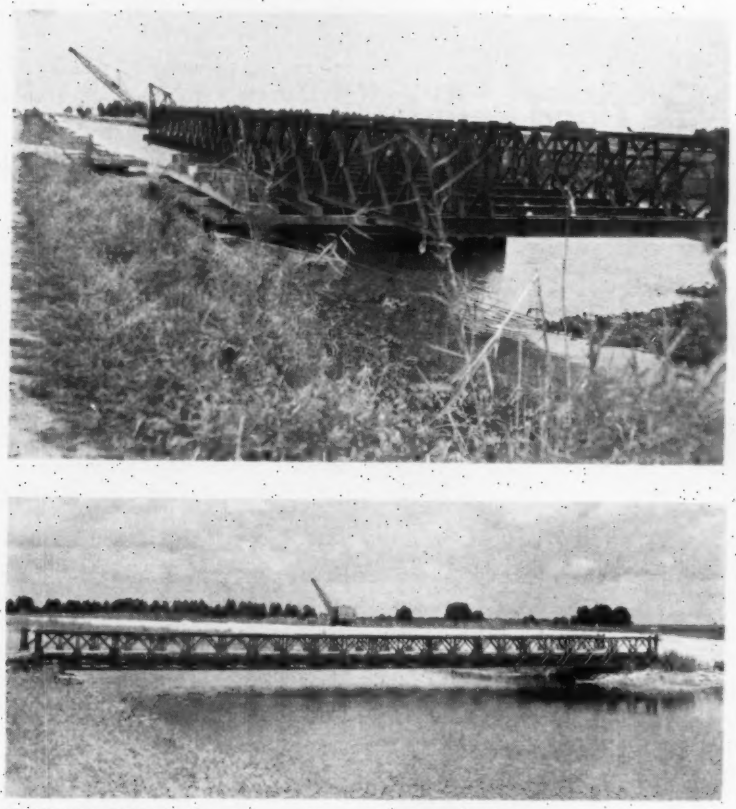
Government agencies account for most Bailey bridges erected today, especially in disaster relief jobs. But contractors put up their share, too.

One of the big advantages of Bailey equipment is that it is adaptable to various lengths of span. It also lends itself to several types of design, including suspension and floating bridges.

Bypass Bridges

This is the most logical and common application of the Bailey in construction. A contractor can erect a bridge quickly in almost any location to provide a rough but satisfactory means of keeping the traffic moving around a construction site. After the job, he dismantles the bridge and uses it somewhere else.

One of the first Bailey's used for this purpose figured in the



MOVEABLE BRIDGE—A Bailey on a barge (above) moves ahead of canal dredges. When temporary span is needed, barge swings around, places Bailey across canal (below).

repair of a spectacular bridge accident just after the war. A drifting freighter had ripped out 240 ft of the truss and plate girder Grace Bridge over the Cooper River at Charleston, S. C.

It was important to keep traffic moving across the bridge during the repair work and a Bailey span managed the trick. Tidewater Construction Corp. of Norfolk, Va., borrowed some Bailey equipment from the Army, and within a few days had spanned the gap with a double-story Bailey, supported in the middle on a temporary steel tower.

The Bailey kept traffic moving, and it was set high enough so Tidewater crews could proceed with the permanent repairs underneath.

Dominion Bridge Co. of Montreal recently set up the longest bridge ever sold commercially as a single unit. It is on their job of raising the Jacques Cartier Bridge to clear the St. Lawrence Seaway.

The Jacques Cartier Bridge is one of the main road links leading to Montreal, and Dominion had to maintain the traffic during the months it took them to raise the bridge.

They did it with 1,200 ft of Bailey bridging, one roadway on each side of the main bridge, supported on a series of structural steel piers.

Dominion Bridge also built a big Bailey to replace the Duplessis Bridge near Three Rivers, Que., Can. When this multiple span bridge collapsed several years ago, Dominion used over 300 tons of Bailey equipment to form two 1,000-ft bridges across the river. The Baileys kept traffic rolling until the permanent bridge was replaced.

Portable Bridges

Bailey material can be re-used repeatedly. Nowhere was this feature better illustrated than on the construction of a series of flood control works in Florida, where the same three 100-ft Bailey bridges were set up in a number of spots.

The Central and Southern Florida Flood Control District, operating under the Corps of Engineers, was converting a series of agricultural drainage canals into flood control works. During the construction of new canals and levees, they had to remove a number of farm access bridges so the dredging contractors could work. But they could not leave the farms isolated.

They needed temporary bridges that could be moved along as the dredging progressed. Bailey units were the most economical answer.

Erection was a problem because a main highway ran directly alongside the canals and it was not practical to block this road for normal Bailey erection.

The solution was to build the Baileys on two 10x40-ft steel barges held together with steel beams. A crane, operating from one lane of the highway, assembled the Bailey truss on the barges while they were parallel to the bank.

Then the barges shifted around so the bridge spanned the canal. The span was lowered onto two previously prepared pile piers by flooding compartments of the barges.

After the dredging and new structures were complete, the process was reversed. The barges, partially filled with water, came in under the Bailey and air was pumped in. This raised the barges and refloated the bridge. The whole assembly moved to the next site and the process was repeated.

Wilderness Construction

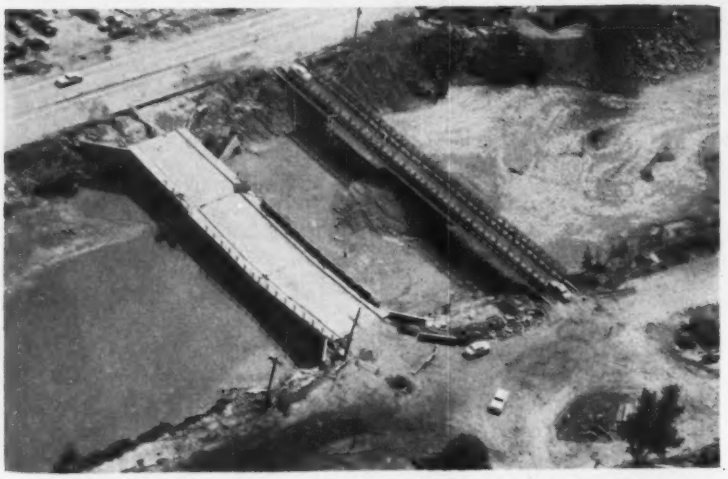
Bailey is sometimes the only practical way to build a bridge in a remote area because the parts are light and compact. This means that they can be hauled in quickly and easily in small loads.

Fast service in a remote area saved the Canadian Gulf Oil Co. a lot of trouble. They were drilling a well in northern Alberta on a site that was separated from the nearest railway siding, 17 mi away, by the Snow River.

Gulf planned to do most of the drilling during the winter when they could haul machinery and equipment across the river on an ice bridge. But in March they realized that the ice would break up before they had finished the drilling. They needed a bridge across the river, and it had to be one that could handle 50-ton loads.

After several long distance phone calls and some fast design work by Contractors Service Limited (principal North Ameri-

Temporary Spans Provide Flood Relief



FAST RECOVERY—When floods wrecked concrete bridge in Waterbury, Conn., local contractors, under Army engineers' direction, soon restored traffic with a Bailey.

NORMAL TRAFFIC—Bailey bridging, often regarded as being limited to single-lane traffic, forms twin bridges in Torrington, Conn., to handle two lanes of traffic.

Semi-Permanent Bridge Opens Road

BUILT TO LAST—Well-built Bailey bridge opens up new section of Trans-Canada Highway. It will stay up several years, eventually will be replaced by permanent bridge.

can Bailey distributor), enough material was on its way to the site to build a two-span bridge across the 320-ft river.

Mannix Ltd., a Calgary construction company, handled the erection with 12 men, a crane and a bulldozer. A Bailey bridge is so simple to erect that the only outside assistance needed was one engineer from Contractors Service. The crew, though highly skilled, had never seen a Bailey before. In six days construction time they completed the bridge, including piers. The whole job took just over three weeks, from the time Gulf made the first phone call until traffic started to roll across the bridge.

Disaster Relief

The best-known applications of Bailey bridging are for replacing bridges that have been destroyed in floods or other disasters. Equipment used for this purpose usually is owned by government agencies. But actual erection often is handled by contractors in the area.

The 1954 New England flood disaster required over 75 Bailey bridges to replace damaged spans. The Corps of Engineers supplied most of this because requirements were far beyond the stocks held by state highway departments. Local contractors, under the direction of army engineers, hurriedly put up the Baileys to get traffic back to normal while they repaired the permanent bridges.

More than half the state highway departments in the United States maintain permanent stocks of Bailey bridging for disaster relief purposes. Federal law also provides for the Corps of Engineers to loan Bailey equipment to civilian agencies in emergencies.

Speeding Highway Construction

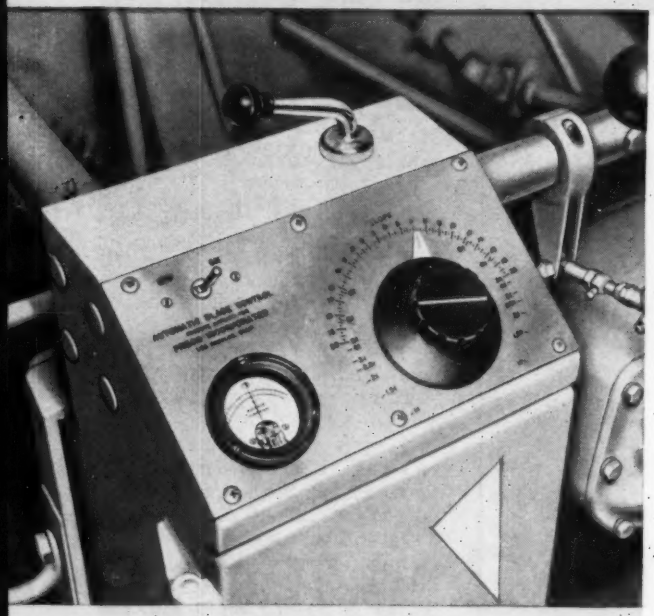
In Canada, the Ontario Department of Highways is using Bailey bridging on a large scale to speed construction of the Trans-Canada Highway.

This 4,600-mi highway project is being built with both federal and provincial funds. However, even with federal assistance, the job is a strain on provincial finances and construction staffs because it is carried out in addi-

JOB REPORT FROM NEVADA ON

AUTOMATIC BLADE CONTROL

–AVAILABLE ONLY FOR CAT MOTOR GRADERS!



JUST DIAL THE SLOPE ON THIS PRECO AUTOMATIC BLADE CONTROL...

...IT CONTROLS BLADE SLOPE WITHIN ⅛" IN 10', REGARDLESS OF TERRAIN!

From job after job, reports are coming in about the performance of the Preco Automatic Blade Control, a major feature introduced last year for exclusive use on Cat Motor Graders. How's it doing? Here's a typical answer from Superintendent Bill Hanson of Isbell Constr. Co., Inc., of Reno: "Work on finish is easier with the automatic control and is very accurate." His remarks are the result of work on a 9-mile, 4-lane freeway project near Carson City, Nevada. As for accuracy, controlling blade slope *within ⅛" in 10'* can be done!

More improvements for the No. 12

Though the No. 12 has earned the reputation of "standard of the industry," Caterpillar constantly looks for and finds ways to improve this machine. Automatic blade control is an example. Here are some other, even more recent improvements:

Longer main frame—a 4¾" longer main frame adds extra clearance between toe of blade and front tire for all blade positions.

Better visibility—31% more glass area in cab increases operator's visibility and efficiency.

Increased operator comfort—new seat adjusts fore and aft. Back rest adjustable, too. Cab 6" higher and cab roof insulated to reduce noise level.

Increased versatility—4" longer tandem provides plenty of clearance for chains even when machine is equipped with large 14.00-24 tires.

Have you seen the improved No. 12?

Because of these and other new features, you can count on the No. 12 for even better work—and faster. Look it over at your Caterpillar Dealer. Better still, look it over in action. Have him demonstrate a No. 12 equipped with automatic blade control. See for yourself how it steps up production!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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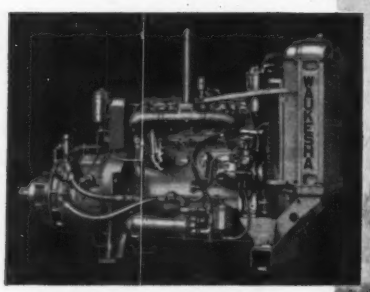
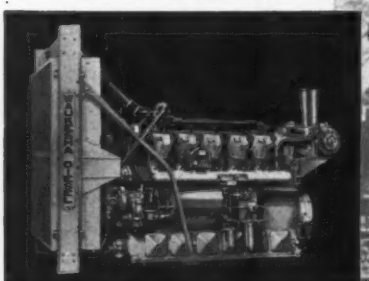
FOR CRANES AND SHOVELS



WAUKESHA 135 DIESEL
Torque Converter Package—
4¼ x 5-in., 426 cu. in.

●

WAUKESHA VLRD8SU
V-12 Turbo-Supercharged DIESEL
8½ x 8½-in., 5788 cu. in.



Complete size range to 1235 hp . . . all standard fuels.

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HANSON QUALITY HCM · CLARK EQUIPMENT · "QUICK-WAY" · Lorain · UNIT · Manitowoc · MICHIGAN · GarWood · LINK-BELT SPEEDER · KOEHRING HEAVY DUTY · INSLEY · ORTON Torque Control · BAY CITY · AMERICAN HOIST · LIMA · MARION

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

NEW YORK TULSA LOS ANGELES

BAILEY BRIDGING . . .
continued

tion to the regular highway program of the province.

Ontario, with one of the longest sections to build, is concentrating on the road itself, and has temporarily spanned rivers and gorges with Bailey bridges. Later they will replace the Baileys with permanent bridges. But in the meantime traffic will be able to use the road.

This leap-frogging technique speeds road work too. Many sections of the route have no convenient alternate route. So, by opening up a section with Bailey bridges, contractors can jump ahead to work on new stretches of the road.

The Ontario Highway Department is a major construction user of Bailey equipment. They have accumulated about 10,000 tons from various sources. About 60% of this is in continuous use; the remainder is stockpiled at four depots throughout the province.

Ontario contracts are probably unique in their handling of Bailey bridging. When a temporary bridge is needed on a job, the specifications require that it be Bailey. This controls the quality of temporary bridging. With a Bailey, highway engineers know exactly what they are getting. If a contractor built a temporary bridge from whatever material he had on hand, the result could be marginal, from a safety point of view.

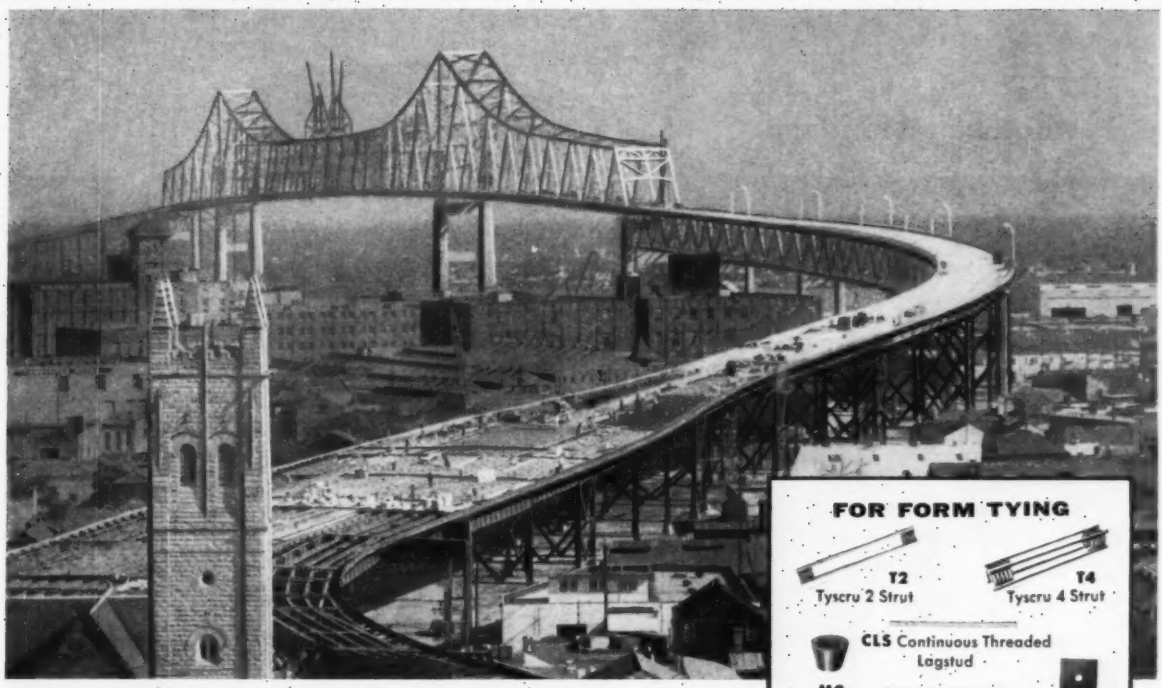
So far, the department has supplied Bailey bridging from its own stocks for all these jobs. But the contractor usually handles the erection.

Suspension Bridges

Spectacular, but rare, is a Bailey suspension bridge. If the clear span required is beyond the capacity of a simple-span Bailey (about 200 ft), and if the terrain precludes intermediate piers, a standard Bailey suspension bridge can cross a clear span of nearly 400 ft.

No one would likely build such a bridge as a temporary structure except in an unusual situation, and since Baileys normally are not economical when used only once, the suspension bridge is not common.

However a power company in New Zealand has built a 240-ft suspension bridge over the Clulba River. The bridge and suspension



Greater New Orleans Bridge at stage in which Richmond products were used.

Another Big One for Richmond!

Dependable Richmond Form Tying Devices used in form work for the new Greater New Orleans Bridge.

The Greater New Orleans Bridge, spanning the Mississippi River and connecting New Orleans proper with Algiers (a smaller section of the city); is the longest cantilever structure in the United States and the third largest in the world. It is signficant that the two major contractors for this important project selected Richmond products for their concrete form tying and hanging. Dravo Corporation of Pittsburgh, Pa. used Richmond Tyscrus and accessories in tying the forms for the giant piers supporting the cantilever superstructure. Boh Brothers Construction Company of New Orleans, used the new Richmond Free-Fit Hanger Frames in hanging the approach deck forms.

The continued and increasing use of Richmond products on so many of the large, important projects in progress today is a strong testimonial for their time and labor saving qualities.

FOR FORM TYING

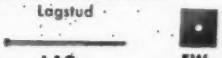
T2 Tyscru 2 Strut

T4 Tyscru 4 Strut

CLS Continuous Threaded Lagstud

MC Malleable Tycones

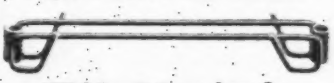
LAG Tylag



FW Flat Washer

The Richmond Tyscru is an extra strong, resistance welded tie designed to take abuse encountered in medium and heavy concrete construction. An extremely simple tie, capable of many combinations and uses in the field, it may be used with or without Tycones depending on the desirability of the spreader action, or combined with Continuous Threaded Lagstuds to form an Adjustable Tyscru.

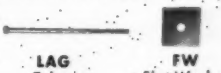
FOR FORM HANGING



HFT-F Free-Fit Hanger Frame Ty
Available in Standard or Offset type

LN Lag Nut

LAG Tylag



FW Flat Washer

The Richmond Free-Fit Hanger Frame Ty is made with over-sized free-fit coils to permit a ½" Tylag to pass thru, to be secured from above by means of a Lag Nut. All installations and adjustments can be made from above the deck assuring easier, faster erection. Forms can be brought up tight against the beam flange, thereby minimizing grout leakage.

Richmond has more than 400 time-tested products, backed by 47 years of experience, for any concreting need. Send for a free copy of the current Richmond Handbook describing the full line of Richmond Form Tying Devices, Anchorages and Accessories...and, if you have a specific concreting problem, let Richmond's Technical Department help you. They will show you how to do a better job safely and economically with Richmond products for the concrete construction industry. Write to—

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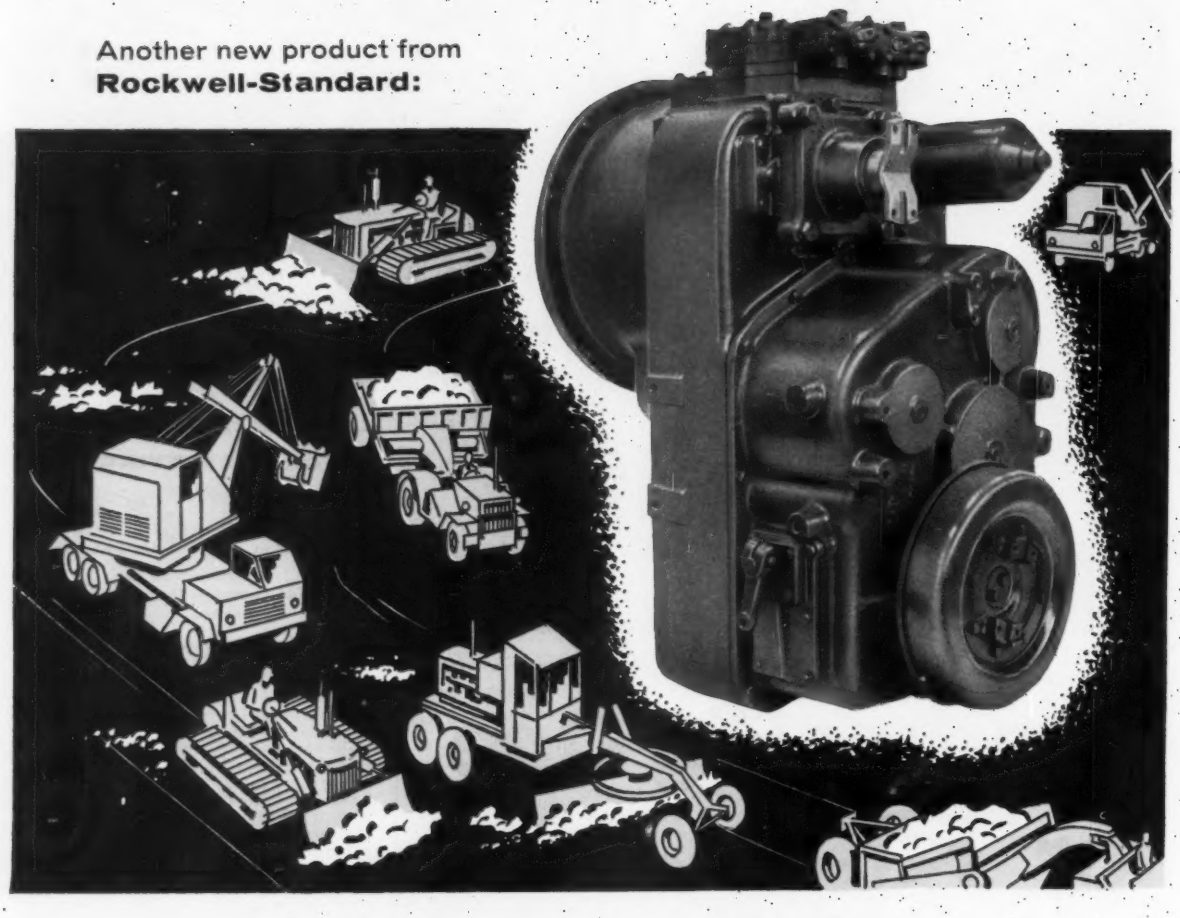

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A torque converter...and 4 speed transmission in one compact package!

Hydra-Drives Power Shift Transmissions put *more* power to work . . . smoothly . . . efficiently . . . economically. Proved in hundreds of vehicles for three years, these units assure top work output of heavy-duty equipment. Engine lugging and heavy shock loads are eliminated. A 3 to 1 torque multiplication makes starting fast and effortless—even with heaviest loads.

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With four speeds forward and reverse, the Hydra-Drives Power Shift Transmission is ideally suited for vehicles which must travel in both directions during a normal work cycle. Rated at 550 ft. lbs. input torque, they can be used with a wide range of internal combustion engines up to 250 H. P.

The Transmission and Axle Division of Rockwell-Standard specializes in drive components only, and *does not compete with manufacturers of end products.* Take advantage of 50 years' experience in the manufacturing of power transmission components, specify Rockwell-Standard.

HYDRA DRIVES
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DETROIT 32, MICHIGAN

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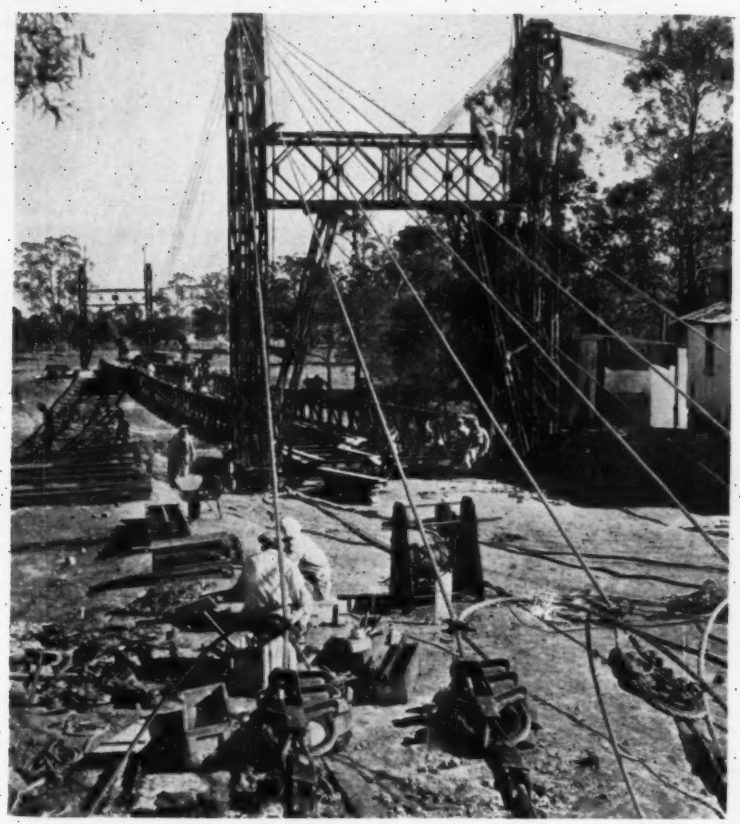
Builders Erect Suspension Bridges . . .



FOR LONG DRY GAPS—New Zealand crews put up a Bailey suspension bridge. Rarely seen, the suspension design uses standard Bailey parts, can span a clear 400-ft gap.

towers are all of regular Bailey parts, except for the saddles on the towers to carry the cables and the hangers (but these parts are available through Bailey distributors). The cables and fittings were not standard Bailey either, but were stock material.

The cost of a suspension bridge may be more or less than that of a fixed span, depending on how many piers are needed for the latter. Bailey material for a 300-ft suspension span with 45-ton capacity recently cost $48,000. Two 150-ft continuous-span Baileys of equal capacity would have cost $65,000. But if two piers could have been provided, the cost of three 100-ft spans would have dropped to $40,000.

Pontoon Bridges

Usually, Bailey spans are built on fixed piers, but they can be set on floating pontoons. If water conditions are right, a pontoon bridge can be built to any length.

During the invasion of Europe, the Allied armies built 29 mi of fixed spans and only 3 mi of floating spans. The percentage of floating spans built since the war is probably even less. But a pontoon bridge solved a troublesome access problem for the Bechtel Corp. and the Anglo Iranian Oil Co. while they were building a refinery at Aden on the southern tip of the Arabian penninsula.

The refinery site was on the peninsula of Little Aden, connected to the mainland by a narrow isthmus. To use the isthmus as an access meant constructing 12 mi of road across the desert, a difficult project to maintain under heavy construction loads.

An 800-ft floating Bailey bridge across the lagoon shortened the haul distance by 10 mi and eliminated the maintenance problem. The bridge floated on 84 pontoons. To allow passage of tugs and barges, a 104-ft section in the middle was made removable, and four protective buoys were anchored at the corners of the navigation gap to protect the bridge from possible damage.

A team of local unskilled labor, under the direction of two Europeans with previous Bailey experience, built the bridge.

continued on next page

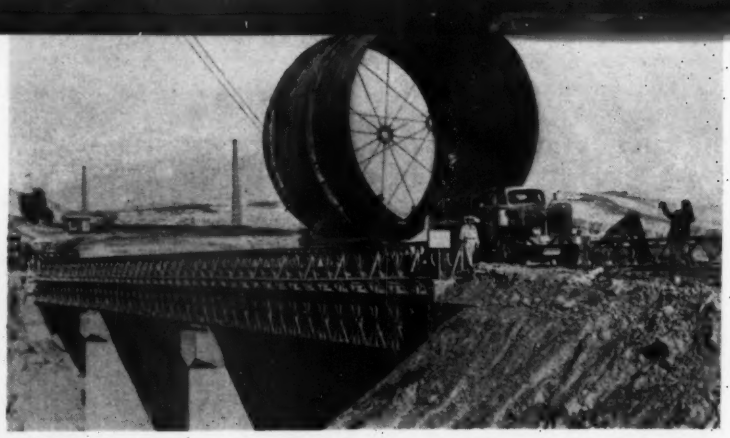
. . . And Floating Pontoon Bridges

FOR LONG WET GAPS—Bailey on pontoons crosses 800-ft water gap on middle east refinery job. Floating spans can be built to any length if water conditions are right.

BAILEY BRIDGING . . .
continued

Wide Roadway

Anyone who saw a Bailey bridge during World War II will remember it as a narrow, single-lane bridge over which heavy vehicles threaded their way with inches to spare on each side. In many cases civilian engineers, with this picture in mind, have not considered Bailey for jobs needing a wide roadway.



WIDE ROADWAY—Big load crosses 30-ft wide construction access bridge. Contractor achieved extra width by putting roadway on top of trusses to form a deck-type bridge.

However, several techniques now are available for wide-lane Baileys. The first is the M-2 design of the U. S. Army. This is 2 ft wider than either the wartime M-1 or the original British design. The current manufacturer also has several models with slightly wider roadways. But these are all still single-lane.

An easier way to get a wide bridge is to put the roadway on top of the trusses rather than across the bottom chords—in other words build a deck type bridge rather than a through truss. With this technique you can go to any width.

Morrison-Garanti, contractors for the Seyham Dam project in Turkey, adopted this method for a 30-ft wide access bridge they required over a diversion channel on the dam job.

This bridge, connecting the dam site with the main camp, had to carry two-way traffic of 40-ton trucks, or a 90-ton Lima shovel traveling along the center.

Morrison-Garanti, in effect, built two standard bridges with a common truss between them. On top they laid an extra-wide deck. The total length of the bridge was 240 ft, split into three spans over concrete piers.

Again, local unskilled labor did the job, with help from a 20-ton crane and a tractor with side-boom. The erection took 16 days.

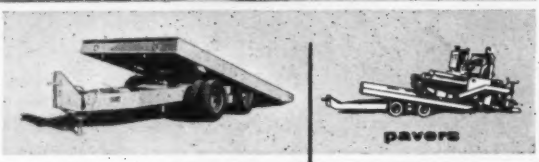
"Flush deck Bailey bridging," as it is now called, is becoming more popular, although it still accounts for only a small minority of bridges. But the manufacturers have come up with standard parts for this type of bridge, and it has become part of the line.

Pedestrian Overpass

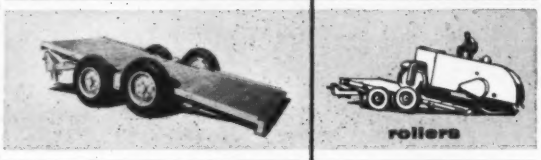
This is not an important phase of Bailey construction but it is worth mentioning because there are a number in existence.

YOU JUST DRIVE ON to load whatever you haul, on a MILLER Tilt-Top

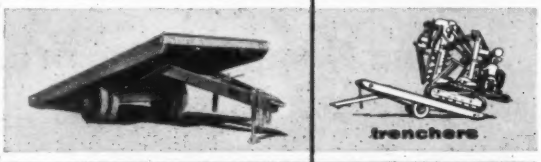
"OT-15"
Over-the-wheels, 8' x 16'-6" platform. 18' and 20' platforms available. Eight wheels, dual assemblies, mounted on tandem axles with oscillating walking beam. 15 ton capacity. Also available with goose-neck for tractor towing unit.



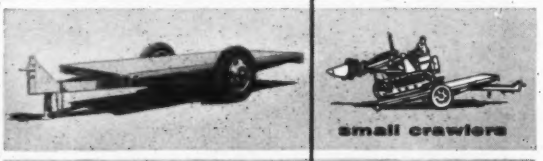
"BT-10" & "CT-7"
Extra low, load angle, between-the-wheels platform, 76" wide — either 14' or 16' long. Four single wheels mounted on tandem axles with oscillating walking beam. 10 ton capacity on "BT" . . . 7 ton on "CT".



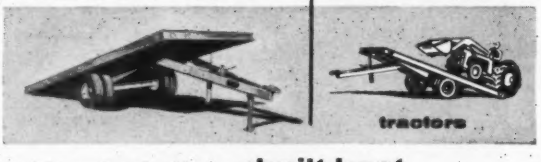
"J-6", "8" & "10"
Heavy duty over-the-wheels models. 8' x 14' platform —16' and 18' platforms available. Single axle, dual wheels. Capacity: "J-6", 6 tons; "J-8", 8 tons; "J-10", 10 tons.



"C-4"
Extra low loading angle, between the wheels platform 8' x 14', 16' platform available. Two single wheels mounted on straight-thru H beam axle. 4 ton capacity.



"H-4"
Over-the-wheels, 8' x 14' platform — 16' platform available. Single straight-thru axle, dual wheels. Completely equipped with heavy duty, first line trailer tires. 4 ton capacity.



• A variety of Tilt-Top models equipped with single or tandem axles . . . over, or between-the-wheel platforms . . . put mobility under all sorts of equipment from 4 to 15 tons . . . save the extra loading time and extra cost of larger more cumbersome trailers. ONE man can tilt, drive on a rig and be off to the next job in less than TWO minutes. See your MILLER distributor now—find out how MILLER'S fast between job loading and hauling . . . can often help you to save duplicating expensive equipment on several jobs.

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See your MILLER distributor or write for FREE literature to:

Miller® Tilt-Top Trailer Inc.
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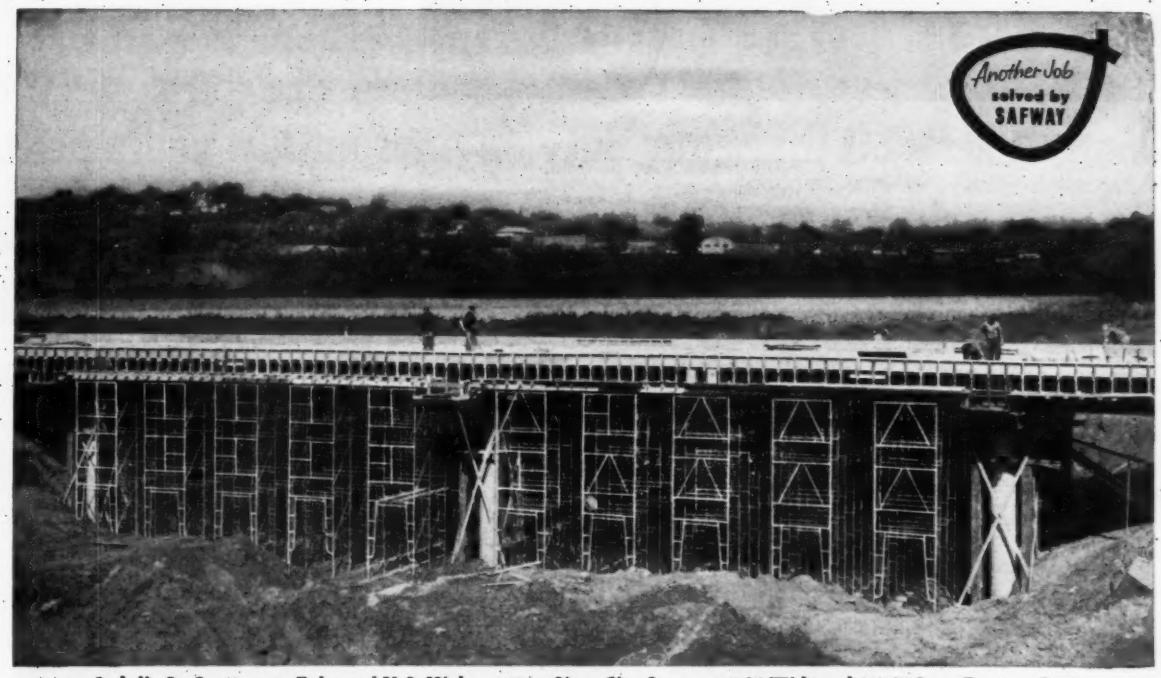
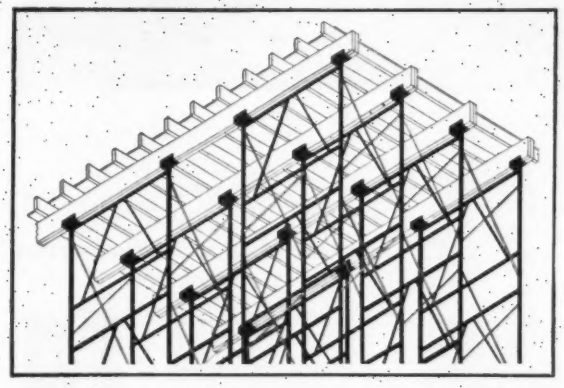


Isabella St. Overpass on Relocated U.S. Highway 77 at Sioux City, Iowa—38' 6" Wide and 48' 6" Long Between Bents

Scaffold Shoring Speeds Bridge Job



How the Scaffold Shoring Was Figured

The number and spacing of the scaffold towers were determined from the weight and height of the bridge deck and the capacity of the wood falsework. With 335 lbs. per sq. ft. of working load, leg spacings of the scaffold towers were set so that each leg could work as close as possible to safe capacity.

Frames in the same plane were set 3' 9" apart. In the other direction, frames were connected with 3' long pivoted steel cross braces. Thus, each of the 300 steel scaffold legs supported over 12 sq. ft. or 4,400 lbs. at a height of 19' 6"—safely, conveniently and economically.

Write FOR FREE CATALOG

Learn all about the advantages of shoring with Safway steel frame scaffolding. Write today for your copy of **BULLETIN** 189.

SETTING AND STRIKING TIME CUT 10.4% BY HOBE ENGINEERING WITH SAFWAY SCAFFOLDING

ROAD AND BRIDGE contractors saw a demonstration of how to save by shoring with Safway steel frame scaffolding on this superhighway bridge job.

Twin 173' spans were successfully completed by the Hobe Engineering Co. of Sioux City, Iowa. Using Safway shoring equipment for the first time, the contractor saved 10.4% over old methods in erection and dismantling time alone, despite adverse weather.

Without tools, standard Safway frames were quickly assembled to fit all job conditions. Towers were spaced to carry an average of 4,400 lbs. on each 19' 6" high scaffold leg. Screw jacks compensated for uneven ground. When the first span was completed, the same shoring equipment was re-used on the opposite roadway.

In spite of bad weather and unfamiliarity with the method, the ease of Safway shoring assembly produced this important saving for Hobe Engineering the very first time on the job.

CONSULT WITH SAFWAY—You, too, can work better—make better profits with Safway scaffolding and shoring equipment. Your nearby Safway dealer maintains ample stocks for SALE or RENTAL, and will help you with planning and erection service. Call him on your next job!

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ENGINEER'S FIELD REPORT

PRODUCT RPM DELO OIL

FIRM C. H. LAWSON, INC.

Using RPM DELO Oil heavy-duty engines outlast equipment

C. H. Lawson, Inc. operates 78 pieces of road building equipment ranging from new to 15 years old, all using RPM DELO Oil. Only one engine has ever required major overhaul and that was not due to lubrication. Firm's chief mechanic, E. C. Miller, says, "RPM DELO Oil has been used exclusively in all our heavy duty engines since 1944. In many cases, it has enabled engines to outlast the equipment." Euclid Earth Mover (above) gets a push from a bulldozer to provide extra traction in wet earth.

TD 24 International (left), one of firm's 12 bulldozers, helps clear the way for a Route 50 by-pass at Riverdale, Maryland. This two year old tractor has operated more than 4,000 hours without engine repairs. Company owner, C. H. Lawson (right), reports that RPM DELO Oil keeps the engines in his equipment in such good shape that—regardless of operating conditions—they average approximately 4 years or 10,000 hours service before even minor repairs are required.

Why RPM DELO Oils reduce wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrorosion of bearing metals
- Inhibitor resists crankcase foaming

For More Information or the name of your nearest distributor, write or call any of the companies listed below.

LUBRICATING OILS RPM DELO

TRADEMARK "RPM DELO" AND DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20

THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

STANDARD OIL COMPANY OF TEXAS, El Paso

THE CALIFORNIA COMPANY, Denver 1, Colorado

They are valuable where large numbers of people have to cross a busy highway for a temporary period. The Canadian National Exhibition in Toronto finds them useful to handle crowds over a main highway on the grounds.

After the need is over, the overpass can be removed and used elsewhere. The Toronto authorities liked their overpasses so much that so far they have not removed them, and the bridges have been in continual use for several years.

Railway Bridges

Bailey units are not generally considered rigid enough for rail bridges, but occasionally they have been adapted for railway work.

Collen Bros. Ltd., of Dublin, Ireland, came up with a neat solution to a bridge repair problem by building a temporary Bailey railway bridge. When floods washed out a bridge over the Tolka River in Dublin, the main northern line of Ireland's Great Northern Railway was cut. The company wanted service restored as quickly as possible, and Collen Bros. undertook to do it.

They planned to put a Bailey bridge across the river beside the damaged permanent span to carry trains while they rebuilt the main bridge. The procedure was the same as for a road bridge except that they had to make extra adaptations for the heavy loads imposed by the trains.

To start with, the foundations had to be heavier. Collen used timber cribbing for one abutment. On the other bank they cut a level bench and braced it with a concrete retaining wall. They sunk steel box piles to form intermediate piers.

Because of the heavy shear stresses from concentrated railway axle loading, they decided on a deck type bridge. They strengthened it still further by moving the trusses in to half the normal highway width. This meant cutting the transoms in half and drilling new holes for positioning.

They launched the bridge in the conventional way, but 4 ft above grade. Then they jacked it down onto heavy distributing girders at piers and abutments. To complete the job they welded special diagonal bracing across the trusses because the standard bracing would not fit the shortened width. While they were at it they added angle beams for wind bracing.

The railway ties went across steel joists, cut from standard Bailey transoms. The railway company supplied continuous lengths of rail, welded at the site, to eliminate the effect of joints on the bridge.

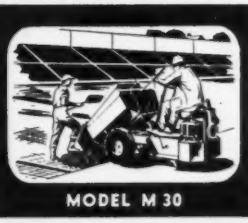
Twenty-one days after the initial collapse, a 66-ton test locomotive moved cautiously across the bridge. Deflection tests showed the bridge to be safe, and 2 hr later a regular 110-ton locomotive pulling twenty 15-ton cement cars made the first regular run across the bridge.

Under this load the maximum deflection at the center of the spans was ⅜ in.—a surprisingly small amount, considering that Bailey bridges normally have a considerable (though perfectly safe) sag in the middle.

continued on next page

MODEL 15 A (flatbed)

MODEL 15 A (bucket)


MODEL M 30

MODEL L 10

PRIME-MOVERS OPERATE PROFITABLY ON MORE JOBS

than any other powered buggy. Outside or under roof, Model 15A PRIME-MOVERS put your materials where you want them. Little or no preparation required as these units use same runways, ramps or hoists you now have. Triple output of labor with same manpower. Regardless of the stage of your job, you can show immediate profit in placing concrete, brick or tile with PRIME-MOVERS.

PRIME-MOVER

PRIME-MOVER CO., Muscatine, Iowa

Please send job reports, estimating data and literature on PRIME-MOVER equipment for:

CONCRETE PLACING ☐; Model____

BRICK HANDLING ☐; Model____

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INTERIOR FALSEWORK—On low-level bridge crews erect truss around Bailey span.

EXTERIOR FALSEWORK—On a cramped site, crews build truss on one bank and roll it across gap on a Bailey bridge. Bailey came across foreground bridge, piece by piece.

BAILEY BRIDGING... continued

Baileys Help Erect Other Bridges

Dominion Bridge Company was one of the first big bridge contractors to see the potential of Bailey structures in bridge erection. They bought considerable war surplus Bailey and their foresight has paid off many times in cheaper and faster erection jobs.

Riverbend Bridge

This bridge, on a tidal river near Alberni, B. C., Can., is a 150-ft steel truss span. It was a tough job for Dominion Bridge because of a rugged site.

The channel at the site is narrow with rocky banks. The bridge was to be only 20 ft above mean water level, but the depth of water was 90 ft. This precluded falsework on piles.

The water level was unpredictable because of tides and seasonal rains. So Dominion Bridge ruled out any "floating-in" scheme, although they considered several in detail.

They finally decided to span the gap with a Bailey bridge, then use it as falsework on which to erect the main truss. But there was one unusual twist.

Clearance above high water was not sufficient to put the Bailey under the permanent truss. So they built the permanent bridge around the Bailey. When it was finished, the Bailey was inside it.

The Bailey was a 160-ft span of triple-double construction. It was strong enough to support the main bridge provided it was stripped of everything but essentials. To lighten it further all erection equipment, including the crane, was mounted on a 400-ton scow moored in the river beside the bridge.

Crews hung the new span by its floor beams from the top chord of the Bailey falsework on pairs of 1-in. rods. The rods passed on either side of the heavy floor beams and were fitted with channel yokes at top and bottom. The lower channels passed under the floor beams. The upper yoke sat on the Bailey truss.

The rods were screwed into the channels with 18 in. of thread at the top end. This allowed the erection crew to put the full camber on the truss before completing the bolting.

Anlaw Bridge

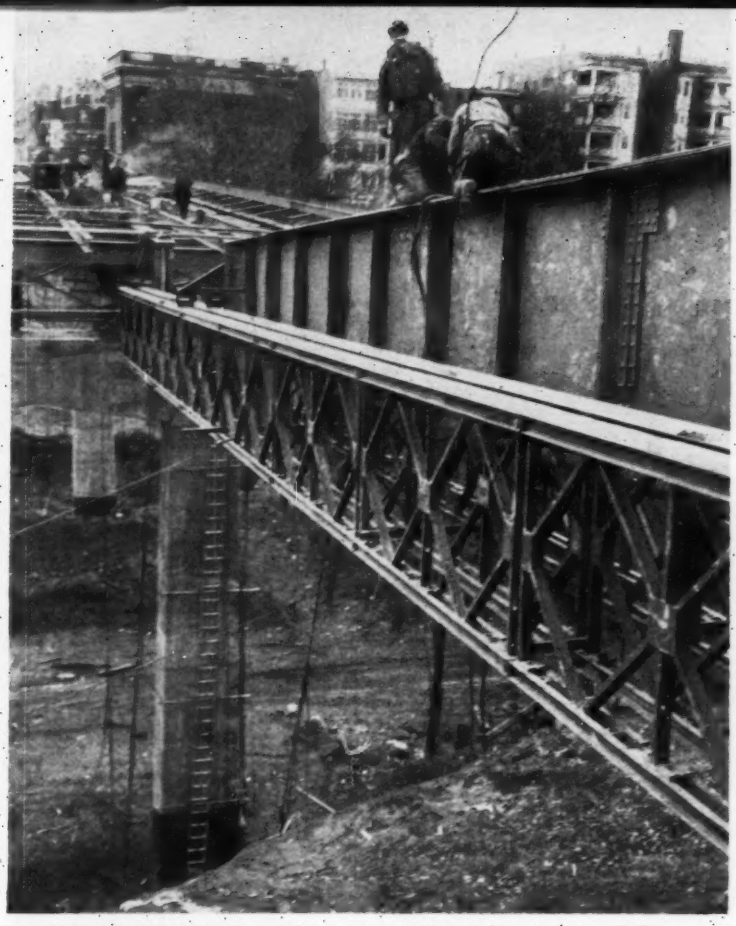
The Anlaw Bridge crosses the Skeena River, near Hazelton, B.C. Like the Riverbend bridge it is a through truss, and the site also was a tough one.

The river is 50 ft deep so timber pile falsework again was impractical. But this time there were more complications.

The sheer banks rise 60-ft above the water level so it would have been tough to handle the erection with floating equipment on the river. The span was nearly 200 ft long, and cranes couldn't handle the job from the banks either.

So Dominion Bridge put a double Bailey bridge across the gap. Then they built the main truss on one bank, put it on wheels, and rolled it across the Bailey span.

There was one other reason why Bailey was a natural for this job. The best bank for erection was the far bank. The only way to get to it at first was over a rickety wooden suspension bridge that was limited to 5 ton loads. Dominion moved the Bailey equipment across the bridge in



LAUNCHING RUNWAY—Crew rolls an 18-ton bridge girder out along a Bailey runway. Bank is so steep that cranes cannot get close enough to erect girders for end span.

light loads and erected it from the other side.

Sherbourne Bridge

The 410-ft Sherbourne Street Bridge in Toronto is a four-lane, multi-span, plate girder bridge crossing a dry ravine. It was a routine erection for Dominion Bridge, except for the spans near one bank.

This bank was so steep that truck cranes, which erected the other spans from the bottom of the ravine, could not work on it.

So Dominion crews built a sloping Bailey bridge from the top of the bank to the first concrete pier and rolled the main girders out on it. The biggest girder they handled in this way was 80 ft long and weighed 18 tons.

They fitted the girders with temporary brackets carrying rollers. On the bank a crane lifted a girder onto the Bailey ramp, and crews slid it down to the end of the ramp where they pin-connected the lower end to the adjacent span. Then the crane on the bank lifted the bank end of the girder, the crew removed the rollers, and the crane lowered the girder into position on the abutment.

Bailey Gantry

An English contractor, James Miller and Partners, Ltd., came up with an imaginative traversing gantry to erect prestressed concrete girders for the Clifton Bridge over the Trent River in Nottingham, England.

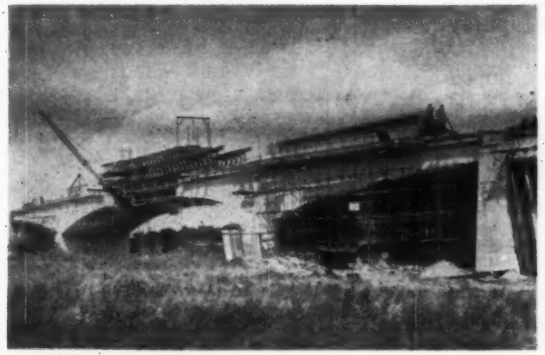
The bridge consisted of a series of concrete spans with seven beams in each span. The 62-ton beams were 104 ft long and 7 ft deep.

After the piers were completed the crews built the first land span. They supported the formwork for that span on a Bailey structure, but this had nothing to do with the gantry that helped erect the subsequent spans.

To make the gantry they placed a double-single Bailey span across the gap between two piers, launching it in the normal way with a launching nose. They had laid rails transversely across the piers under the gantry so it could move back and forth across the width of the bridge and position itself above the line of a girder.

A second set of rails ran inside the gantry along its length to carry in the girders. The launching nose was dismantled and reassembled at the tail of the gan-

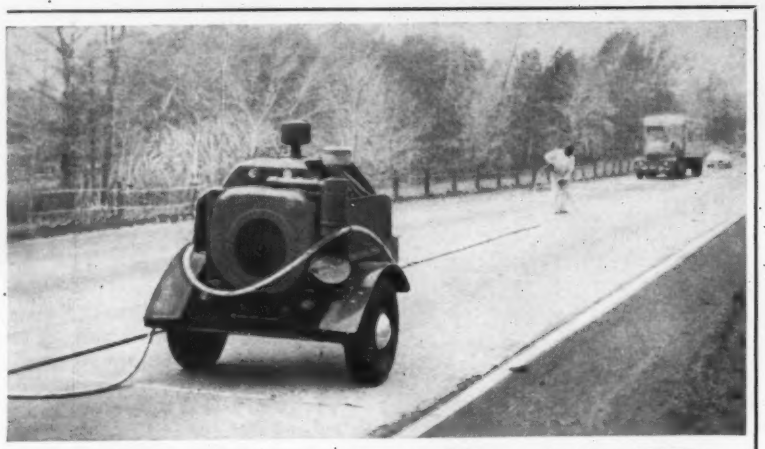
Bailey Gantry Moves Concrete Girders



CASTING THE GIRDER—Concrete girder is cast and prestressed on adjacent span of the bridge, then rolled on rails into gantry.

ERECTING THE GIRDER—Gantry moves on rails across width of bridge to proper position. Special hoist lowers girder onto its seats.

MOVING THE GIRDERS—After girder is prestressed, crews jack ends onto small carriages so they can roll it along into Bailey gantry for final positioning in bridge.



NEW 56 HP.
WISCONSIN ENGINE
drives compressor delivering
125 cubic feet of air per minute

Another application for the new model VR4D Wisconsin Heavy-Duty Air-Cooled Engine!

COMPRESSOR STATISTICS: Complete compressor-engine unit weighs only 1675 pounds, yet produces 125 cubic feet of air per minute. Built by P. K. Lindsay Co., Inc., Everett, Massachusetts.

ENGINE FACTS: Largest in Wisconsin line and equipped with traditional features, V-type 4-cylinder VR4D model is rated from 43 to 56 hp. between 1400 and 2200 rpm.

Get complete specifications. Write for Bulletin S-207 today.

Also, ask for bulletin S-223 describing all models, 3 to 56 hp.... single-cylinder, 2-cylinder and V-type 4-cylinder models. All models can be equipped with electric starting.

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BAILEY BRIDGING ... continued

try to extend the rails back to the casting area.

The girders were cast and prestressed on the previously completed span. Crews mounted the girder on trollies, then pushed the girder along the track into the gantry. The gantry picked it up, moved sideways into position, and lowered it into place.

Falsework

John Morgan Ltd. of London built a Bailey bridge to carry formwork for a concrete conveyor bridge over an 80-ft canal at the new Hackney Power Station.

Restricted working space called for an unusual launching. They built the bridge on bogies along a rail line at right angles to one bank.

At the edge of the canal they moored a barge fitted with a timber crib support for one end of the bridge. They pushed the bridge along the rails until the front end rested on the barge. Then they pushed the barge broadside across the canal. When the front end of the bridge reached the other side they partially sunk the barge with water ballast to position the bridge.

Any long length of form support will sag a little. But Bailey sags more than most other shoring.

Morgan engineers determined the deflection by loading the bridge with uniformly distributed sheet piling, equal to the proposed weight of concrete.

Knowing the exact deflection of the Bailey, they were able to put packing under the forms to produce the required camber.

Stretch Dollars – Save Manpower with equipment that does more . . .

WORK BULL 1001

CONVERTS INTO EIGHT DIFFERENT MACHINES AND OUT-PRODUCES EXPENSIVE SINGLE-PURPOSE EQUIPMENT

Davis 210 Backhoe on Work Bull 1001 has its own backfill blade; same machine handles digging and backfilling.

The Work Bull 1001 as a rotary broom has 96" swath, 30° left and right hydraulic angle control.

Work Bull 202 and Davis Loader-Backhoe have been integrated for maximum efficiency.

UNEQUALLED VERSATILITY The Work Bull 1001 obsoletes single-purpose machines that sit idle most of the time. This top-quality, 60.3 h. p. rig converts from a 7/8 cubic yard Loader to a Pick-up Sweeper . . . to a Backhoe (with its own backfill blade) . . . Fork Lift . . . Crane . . . Angle Dozer . . . Rotary Broom . . . and back to a Loader and Scarifier right in the field. Each performs so efficiently you will think it is intended for just that one purpose.

INSTANT REVERSING WITHOUT SHIFTING To change direction of travel on the Work Bull 1001 you simply switch your foot from the forward acceleration pedal to the reverse acceleration pedal. No gears or levers to move. This, plus power steering, torque converter, five-speed transmission in either direction, and left and right brakes lets you work circles around other machines.

43° ROLLBACK AT GROUND – DIRECT LINE THRUST You actually get "bull-dozer" action when digging plus more breakaway. Special shock load absorbers reduce spillage and cushion load in rough terrain. Also has "float" position so attachment can ride **over** the surface on which it is working.

LOW PACKAGE PRICE It costs so little to own a Work Bull 1001. Select the basic unit and whatever attachments you need. It will cost you less than what you normally pay for a single-purpose machine.

OTHER POWER MATCHED MASSEY-FERGUSON EQUIPMENT include the Work Bull 202 (40 h. p.) Tractor, Work Bull 303 (54.5 h. p.) Tractor, Work Bull Fork Lift, Davis Loader and Backhoe, plus a multitude of integrated attachments for each basic unit.

For information on the complete Massey-Ferguson line ask for Brochure G-4. For specific information on the Work Bull 1001 ask for Brochure W-1. Write Massey-Ferguson Industrial Division, 1009 South West Street, Wichita 13N, Kansas.

MASSEY-FERGUSON INDUSTRIAL DIVISION

INTERSTATE HIGHWAY SYSTEM

REPORT FROM OKLAHOMA:

CATERPILLAR EQUIPMENT SPEEDS INTERSTATE SYSTEM BYPASS

In clay and rock on the eastern edge of Oklahoma City, Noland Smith Construction Co. is carving out a 1½-mile bypass to U.S. 77, part of the National System of Interstate and Defense Highways.

At work is a 100 per cent Caterpillar team of earthmoving equipment that includes: eight Cat DW15 wheel-type Tractors with No. 428 LOWBOWL Scrapers, two DW21-No. 470 combinations, two D8 and one D7 track-type Tractors, and a No. 12 Motor Grader—14 big yellow machines in all.

The job involves moving some 600,000 cu. yd. of material. Six DW15-No. 428s moved 200,000 cu. yd. on a 2,400-ft. haul. And top daily production has been 7,400 cu. yd. A D8 with No. 8 Ripper breaks up rock where necessary. 400,000 cu. yd. on a 6,500-ft. haul were moved with eight DW15-No. 428s and two DW21-No. 470s. Top daily production has been 5,600 cu. yd. Average cycle time, 11½ minutes.

As the tempo of work increases on the 41,000-mile system of superfreeways, more and more contractors are standardizing on Caterpillar equipment. A recent survey of the $415 million Illinois Toll Highway showed that 53 per cent of the equipment at work was Caterpillar.

These contractors have found that for profitable production you can't beat the combination of good machines and good dealer service. You get *both* from Caterpillar. Ask your Caterpillar Dealer today for an on-*your*-job demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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NEW BYPASS *will provide two 36-ft. main roadways and two 32-ft. service roads to U.S. 77, part of the Interstate Highway System, the greatest construction job in history.*

FAST CYCLE TIME *depends on swift, sure loading. Here a Cat D8 Tractor push-loads a DW15-No. 428 Tractor-Scraper combination. LOW-BOWL design assures a full load at every pass.*

BREAKING UP ROCK *is this D8, equipped with No. 8S Bulldozer and No. 8 Ripper. The high-speed haul roads used by the tractor-scrapers are maintained by a Cat No. 12 Motor Grader.*

"CATERPILLAR EQUIPMENT *gives us low-cost operation and low maintenance," says owner Noland Smith. "Add to this easy loading and speed in hauling and you have top production."*

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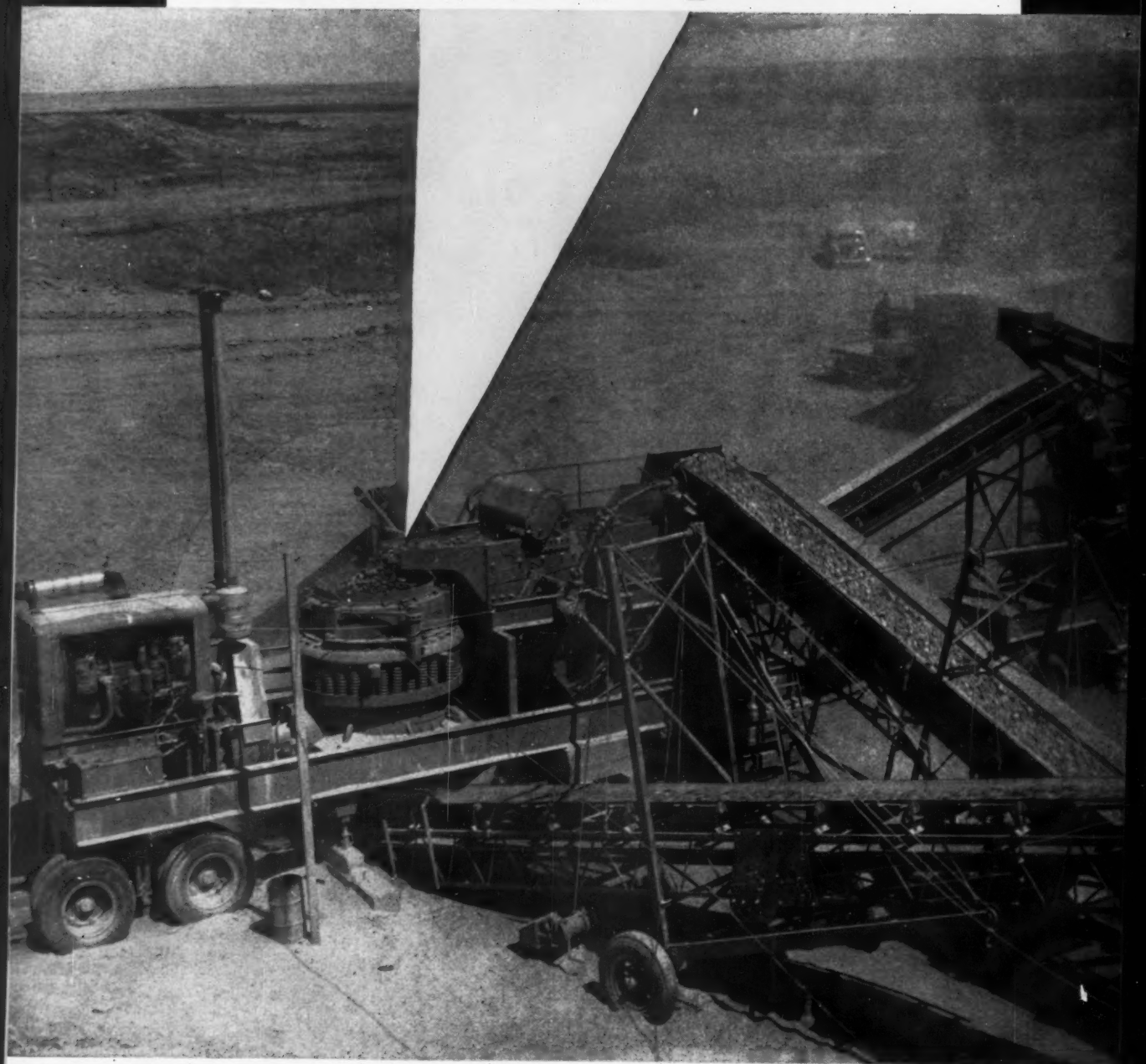
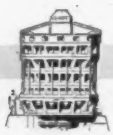
CONE CRUSHERS
in portable plants





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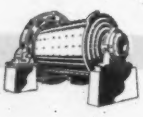

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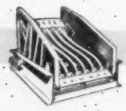

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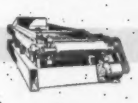
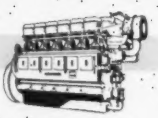


SYMONS VIBRATING SCREENS

NORDBERG KILNS DRYERS, COOLERS



NORDBERG ENGINES

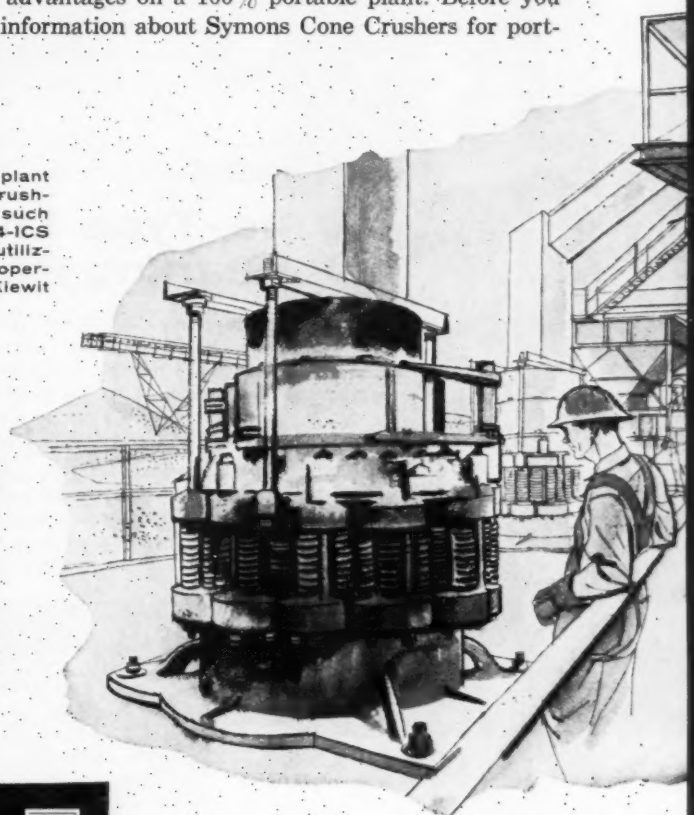
...a Profit-Making Combination for the BIG JOBS ahead

When you combine the proven ability of Symons Cone Crushers to produce big capacity of accurately sized product, together with the complete mobility of a portable plant, you gain many of the advantages of stationary plant operation that you can take right to the job. That's the combination that helps you beat competition and make more money on the big jobs ahead.

Here's where portability pays off—With the plant working close to a big dam project, concrete construction job or airport project, you cut hauling costs and save time. On roadbuilding contracts, the portable-mounted Symons Cone Crusher often can move to the job site, or move from pit to pit to take advantage of better material or more favorable crushing percentages. On bituminous concrete jobs, you can supply specification material to asphalt plants from convenient, near-by locations.

Symons Cone Crushers are known throughout the world for efficient, low-cost performance and high capacities of uniform fine-crushed products . . . and now you can have those profit-boosting advantages on a 100% portable plant. Before you submit your next bid, get full information about Symons Cone Crushers for portable plant service.

(Left): Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as this efficient Cedarapids Model 4-ICS portable intermediate crushing plant utilizing a 4′ Symons Cone Crusher, shown operating near Rapid City, S.D., by Peter Kiewit Sons Co.



—AND FOR STATIONARY PLANTS

Symons Cone Crushers are the choice of leading producers throughout the world for secondary and finer reductions in all types of ore and mineral processing operations. Available in both Standard and Short Head types, Symons Cones are built in sizes from 22″ to 7′ in diameter, for capacities of from 6 to 900 or more tons per hour. *Write for literature.*

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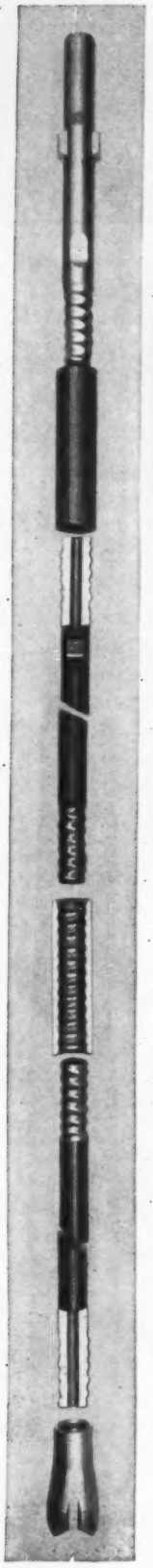
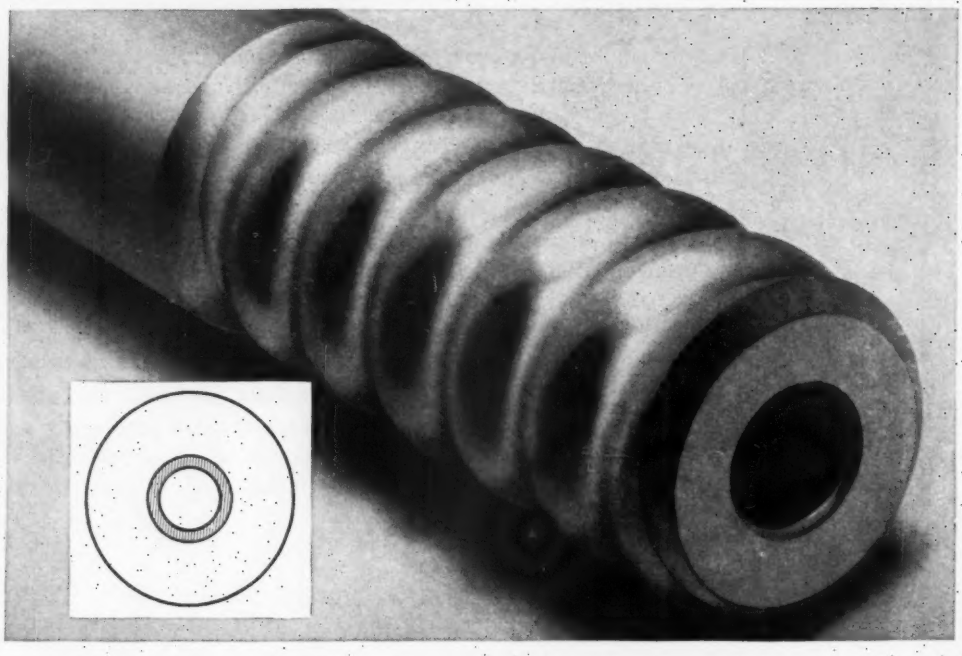


NEW ROPE THREAD MAKES UNCOUPLING EASY WITH SANDVIK COROMANT EXTENSION STEELS



Rope-Type Threads Afford No Starting Points for Fractures

Connections used in extension drill-steel must be easy to assemble and uncouple, and connections must not become weak links during the actual drilling. Sandvik Coromant's new patented rope thread makes it easy to join and uncouple the equipment . . . yet gives a solid and positive connection. The gently rounded form of this thread means trouble-free performance—eliminates common thread and coupling failures found in "saw-tooth" threads.

The complete equipment—bit, rod, coupling sleeve and shank adapter—are all dependable Sandvik Coromant parts made of world-renowned Sandvik alloy steel. A further advantage to the user is that the steel can be re-threaded.

Atlas Copco has special literature on Sandvik Coromant extension steel and long-hole drilling, available to you with no obligation. We suggest you write today!

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Distributors of COMPRESSORS, ROCK DRILLS, PNEUMATIC EQUIPMENT, SANDVIK COROMANT DRILL STEEL and CARBIDE BITS

PREWET MATERIAL—Tandem scrapers load easily in borrow area where material has been prewet to optimum moisture with a sprinkler system. This is one of several ways in which prewetting fill material before excavation boosts earthmoving production.

Water Cuts Earthmoving Cost

SPRINKLING dry fill material in cut and borrow sections before excavation boosts earthmoving production and cuts costs.

That's what Platte Valley Construction Co., of Grand Island, Neb., found when they hired a firm of specialists to prewet fill material for a highway job north of Chugwater, Wyo.

A sprinkler system covering the cut and borrow areas prewet over 1,440,000 yd of material weeks before earthmoving operations got under way. The controlled application of water brought all fill material up to optimum moisture—even in cuts up to 60-ft deep—before Platte Valley moved a yard of dirt.

The system eliminates the expensive operation of applying water to fill sections lift by lift with sprinkler trucks. That's the big bonus, but the contractor benefits in other ways, too:

- Less traffic on the fills.
- Scrapers load easier, move faster, carry bigger loads.
- Fill material can be brought up in higher lifts.
- Less dust means better job conditions for men and machines.

Job Superintendent Joe Haak says he's convinced that prewetting is the best way to add water to fill material—when conditions permit. On this job conditions were ideal. The material is a silty clay. The particles are small enough to hold the additional moisture for a long time, but not so fine as to prevent water from seeping down through the material to the bottom of the cuts.

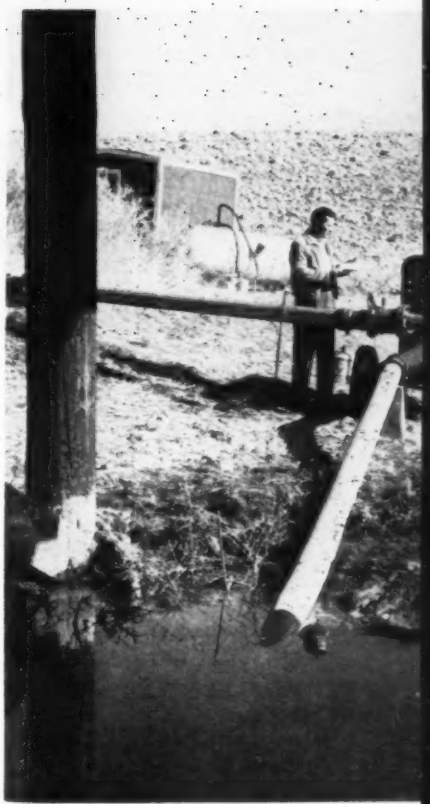
Two creeks on the job supplied water for the sprinkling system so there was no need to dig wells. And the amount of water required to bring the dry material up to optimum moisture was large enough to justify the expense.

Principle of the system is simple—it's just a glorified garden sprinkler. A network of pipes carries water to sprinkler heads set at intervals over the cut area. Water sprinkled over the area seeps down through the soil gradually and brings moisture content up to optimum. Amount of water applied is carefully controlled so that final moisture content is uniform all the way to the bottom of the cut.

Industrial Pipelines, of Holdredge, Neb., handled the subcontract for sprinkle-irrigation of the cut sections on the job. Together with Platte Valley, they pioneered the application of the system to highway work.

Industrial Pipelines President John B. Vaughan says: "If you make your calculations carefully and set the sprinklers right, you can put water down as much as 70 ft."

First step in Industrial Pipeline's planning is investigation of soil types at a site. Company experts take soil samples and run tests to find out how much moisture the soil holds and how much it needs to reach optimum moisture content—the point at which



PUMP FEEDS WATER — Dammed up creeks at each end of job provide water,

METER CHECKS FLOW—Job foreman takes meter reading to keep tabs on gallons of water pumped. Subcontractor applied 50,000,000 gal at $1.15 per thousand gallons.

WATER CUTS EARTHMOVING COSTS . . . continued

compactive effort produces the maximum density.

In placing the sprinklers, engineers consider not only how much water the soil needs, but how deep it must penetrate to reach the bottom of the cut and how fast the soil will take water. Permeability of the soil is an important consideration in fixing rate and duration of sprinkling.

On the Chugwater job, parallel rows of sprinkler pipe on 60 to 80-ft centers covered the cut sections. Maximum number of rows was five in the widest cut. The sprinklers were mounted on the pipes at intervals of from 40 to 60 ft. Sprinkler pipes were 4 to 5-in. sections of Rain Chief aluminum pipe with McDowell quick couplings. Feeder lines that carried water from the pumps at the source of water were 6 to 8 in., depending on the number of sprinklers operated at once. Maximum length of feeder line in use at any one time was 3 mi. Another mile of pipe was on hand for the sprinkler lines, but only about half of it was in constant use.

Two creeks—one near each end of the job—supplied enough water when dammed up to permit operation of two sprinkling networks at once. Three Gorman-Rupp and one Construction Machinery pumps powered the system. The rated maximum discharge pressure of the pumps was 160 psi. But providing water to as many as 66 sprinklers required higher pressures, and Industrial Pipelines ordinarily operated them at 180 psi. When bearing trouble developed, the company designed a special impeller to solve the difficulty. The propane-powered pumps were operated continuously, 24 hr a day, while on the line.

About 33 gal of water per cu yd of material was required on

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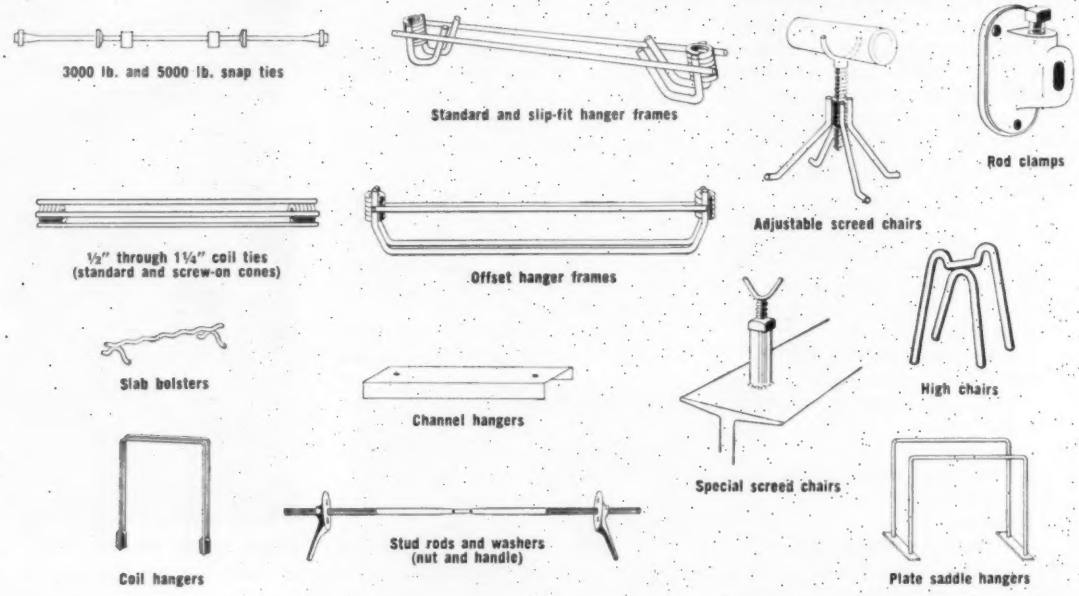

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the Chugwater job. Kenneth Sughroue, chief engineer for Industrial Pipelines, figured a penetration rate of 4½ ft per 24 hr for the silty clay in the cut areas.

The prewetting was done weeks before Platte Valley started major earthmoving on the job. Depending on the type of soil, prewetting can be done months ahead without appreciable loss of moisture.

The prime contractor found that prewetting smoothed the way for his scraper operations. Production was much better than normal. For example, superintendent Joe Haak has two tandem scrapers hauling from one cut section, where ordinarily he'd have four single scrapers, each with its own tractor. And with two less tractors he gets better production. A single operator on one of the tandems has moved as many as 128 loads (two on each haul) in one shift over a 600-ft haul. Under ordinary conditions, without prewetting, a single tractor-scraper combination would do well to move 70 to 80 loads in an 8-hr shift.

Platte Valley also has a team of six Caterpillar DW-21's moving dirt, and their output also has been substantially higher than normal. Because the fill material doesn't have to be sprinkled and cultivated on the fill, thicker lifts can be applied. This means additional speed for the machines; the DW-21's can spread their lifts without shifting out of high.

Freedom of traffic on the fill is one of the most important advantages to the contractor. "If we were moving dry dirt," Haak says, "we'd have two graders and two tractors with cultivators on the fills. There'd also be maybe eight sprinkler trucks running back and forth wetting down each lift. And everybody would be in everybody else's way."

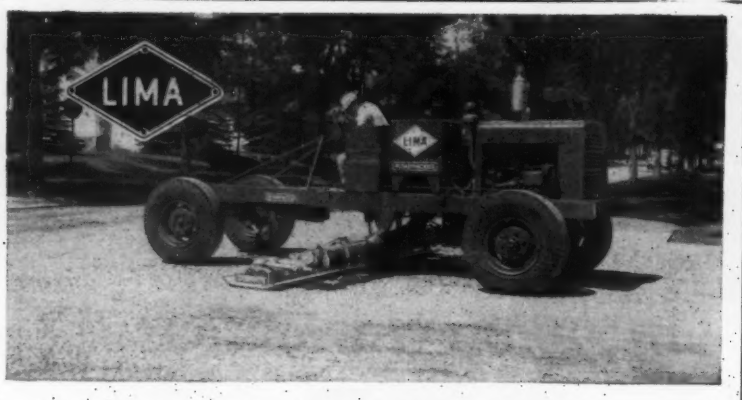
Less dust means big savings in equipment maintenance, besides much better working conditions for the men. Haak says his machines go almost twice as long without overhaul on the relatively dust-free Chugwater job.

The prewetting system is not foolproof, however. In inexperienced hands it can backfire. If too little water is added, the contractor must go to the extra expense of sprinkling on the fills. If too much water is added, the material becomes hard to handle.

Highway engineers check on Industrial Pipeline's work by testing soil samples taken regularly from the fill for proper moisture content and density. They also check the bottom of cuts to see if unnecessary water has percolated below final grade. Industrial Pipelines controls penetration by drilling an occasional test hole as planned.

Total excavation on the Chugwater job amounted to 1,440,000 yd, of which 250,000 yd was borrow—prewet in the same way as the cut sections. Industrial Pipelines applied about 50,000,000 gal of water altogether, at a bid price of $1.15 per thousand gallons.

Industrial Pipelines first used the prewetting technique on a railroad relocation job in 1951. The company since has used the method at Oahe Dam in South Dakota and on several highway projects.



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Widener Attachment—Vibrating shoes compact material in widening trench while Roadpacker runs on existing pavement. Easily adjusted for various width trenches.

Six 420 lb. shoes provide the vibrating and tamping action. The LIMA ROADPACKER is a cost-cutting, vibratory compactor that penetrates deeper and covers a 13-ft., 1-in. width. The shoes are raised and lowered hydraulically; compacting is done equally well forward or in reverse. The ROADPACKER travels to the job at 28 m.p.h.

Get the full story on the LIMA ROADPACKER today. See your nearby distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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- **Low maintenance**—*Rugged vibrator shoes are pressure lubricated and actuated hydraulically through a completely sealed system. There are no exposed moving parts, no oil levels to check, no breather holes through which oil can escape.*
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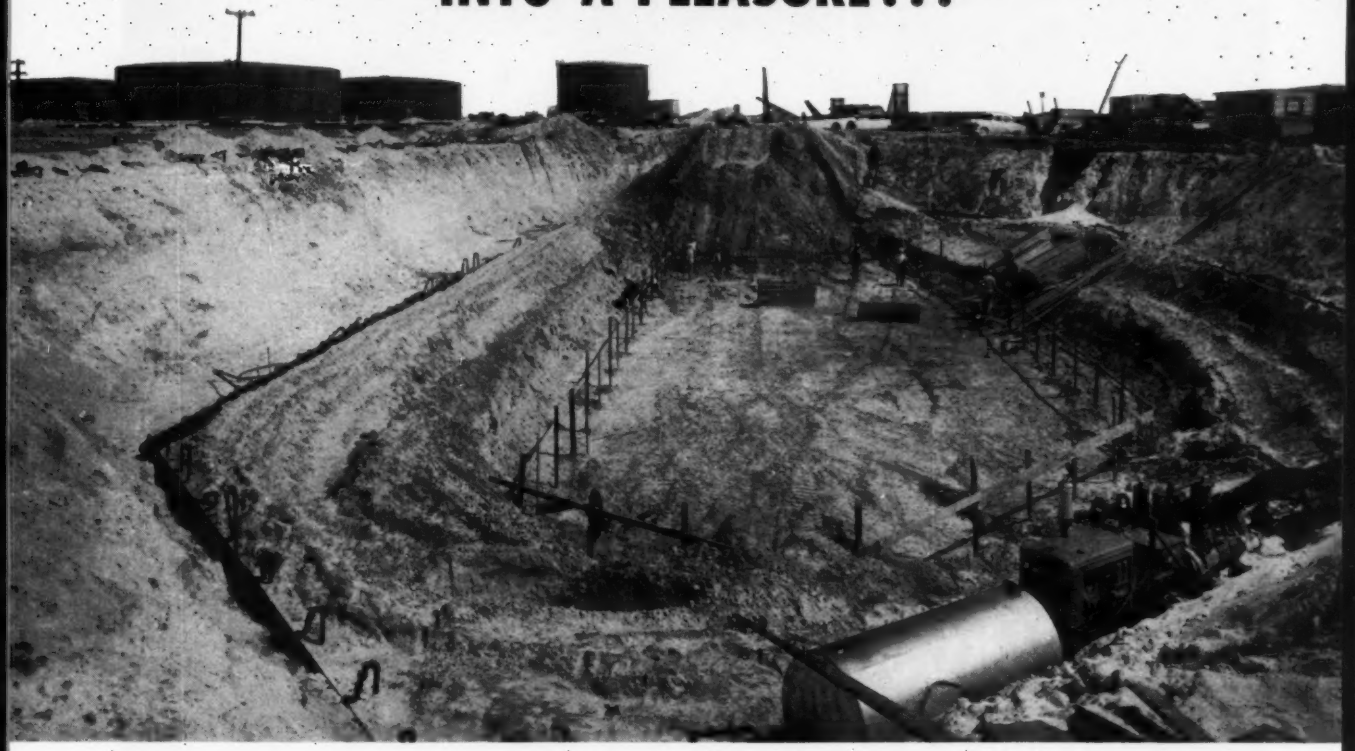

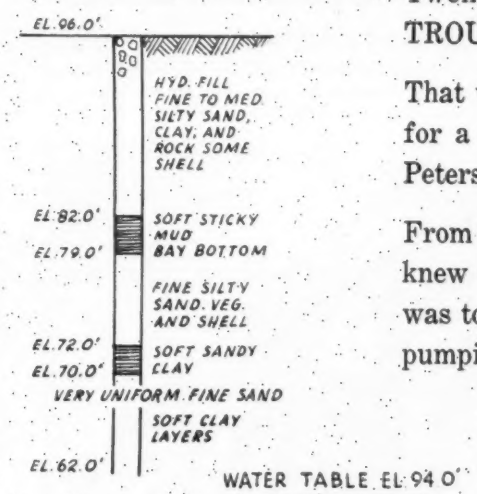

Twenty feet of water in silty sand with clay layers spell TROUBLE!

That was Florida Power Corporation's problem in excavating for a Discharge Canal for the Paul L. Bartow Plant in St. Petersburg, Fla.

From past experience on an intake well in the same area they knew that the quickest, most economical way to handle water was to install a topnotch wellpoint system. Twenty days after pumping started, the job was excavated to subgrade—in the dry.

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To replace it, the Florida State Road Department chose a fixed span bridge of prestressed concrete. *The ease of construction, low initial and maintenance costs, and sleek modern appearance of prestressed concrete* were the deciding factors.

In the manufacture of the prestressed beams and piling, R. H. Wright & Son used Lehigh Early Strength Cement for maximum production efficiency. The units were completed quickly, ready for trucking to the job site as needed.

This is another example of the use of Lehigh Early Strength Cement in modern concrete construction.

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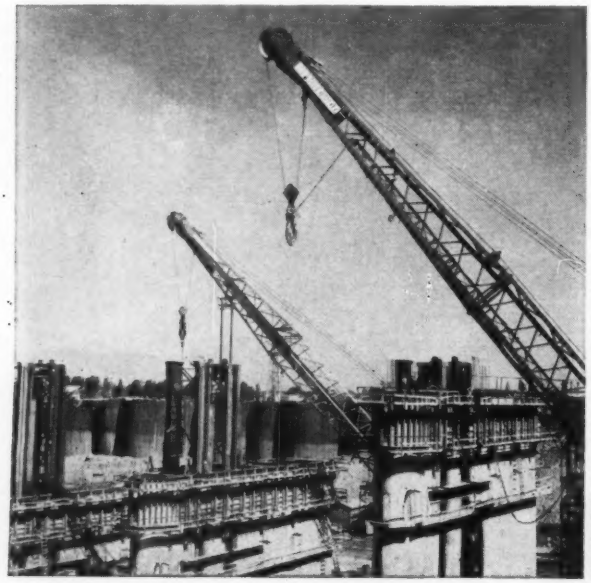
1 **MR. WIRE ROPE**—Ed Carey (right), Tiger Brand Wire Rope sales representative, is known as "Mr. Wire Rope" on the St. Lawrence Seaway & Power Projects. Ed is checking sheave grooves on a walking dragline with Mr. Mel Poeschl, Equipment Superintendent for Waddington Constructors, combine composed of Kiewit, Morrison-Knudsen.

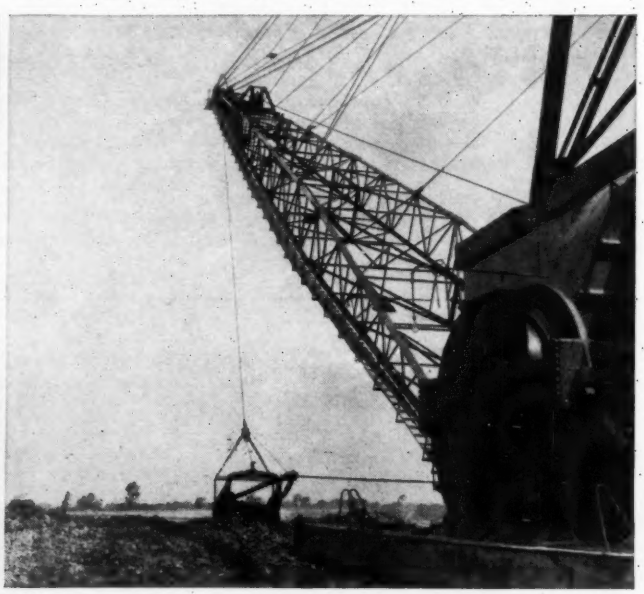
2 **GRASSE RIVER LOCK**, St. Lawrence Seaway. Gantry cranes rigged with 7/8" 6x19 Tiger Brand Hoist Ropes are pouring a total of 376,000 cu. yds. of concrete. This lock is one of two which will provide for raising and lowering vessels to and from the lake created by the Barnhart power dam and the Long Sault spillway dam. General Contractors: Joint venture between Perini, Walsh, Kiewit, Morrison-Knudsen and Utah.

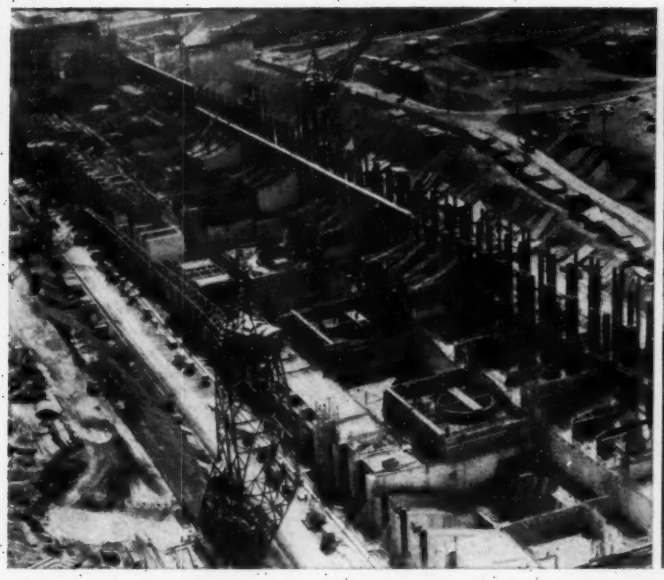
Tiger Brand Wire Rope makes things hum

5 **IROQUOIS DAM**, New York State Power Project. Located 25 miles upstream from Long Sault Dam. This dam is to control and regulate the outflow from Lake Ontario. Cranes are equipped with 1 1/8" 18x7 Tiger Brand Non-rotating Hoist Rope. General Contractors: Joint venture between Kiewit, Johnson, Johnson.

6 **LONG SAULT CANAL**, mainland portion, St. Lawrence Seaway. Monighan dragline with 13-cu.-yd. bucket equipped throughout with Tiger Brand Wire Rope. The drag rope is 2 1/8" 6x19 Excellay Monitor Lang Lay IWRC. This job involves digging 12,000,000 cu. yds. of heavy marine clay and cemented glacial till, two of the most tricky and unpredictable materials you can find. General Contractors: Joint venture between Kiewit, Morrison-Knudsen.



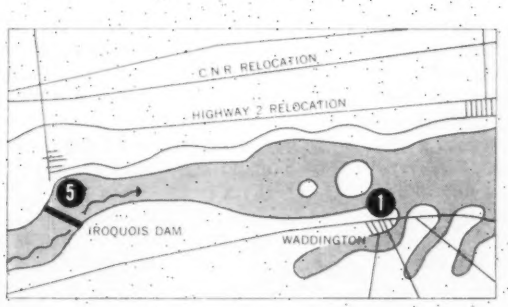


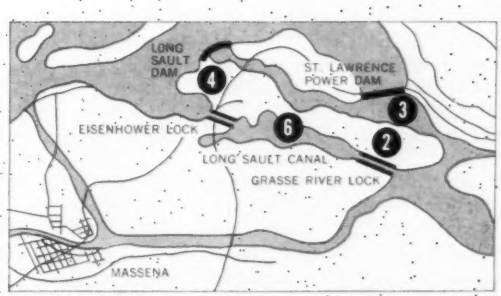


3 **ST. LAWRENCE POWER DAM,** New York State Power Project. Photo shows U. S. Section. Combined Canadian and American power houses will produce 1,880,000 kilowatts, half to each nation. Whirly cranes erecting forms and pouring concrete are rigged with Tiger Brand 7/8" 6x19 Hoist Rope Excellay Monitor IWRC. General Contractors: Joint venture between Perini, Walsh, Morrison-Knudsen, Kiewit, Utah.

4 **LONG SAULT SPILLWAY DAM, FIRST SECTION,** New York State Power Project. This dam controls the flow of water into the power pool and thence to the power dam. At present all of the St. Lawrence flows through this section. General Contractors: Joint venture between Walsh, Perini, Morrison-Knudsen, Kiewit, Utah.

on St. Lawrence Seaway and Power Projects





This is the big year on the St. Lawrence Seaway and Power Projects. Contractors are rushing to complete their jobs on time. Everywhere you look, big shovels and draglines are digging 24 hours a day. Huge gantry cranes are setting forms and pouring concrete. The St. Lawrence River has been moved so many times it doesn't know its own bed.

All this adds up to a situation that demands the most from machines and wire rope . . . and most of the wire rope on the American jobs is Tiger Brand.

Contractors wanted quality wire rope in a hurry. So, American Steel & Wire set up a warehouse in nearby Massena. They staffed it with competent men who brought in a complete stock of Tiger Brand Wire Rope in all types and sizes. Thus, the best rope obtainable could be delivered to the job sites in a matter of hours. The illustrations show a few of the locations where Tiger Brand Wire Rope is hard at work. American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

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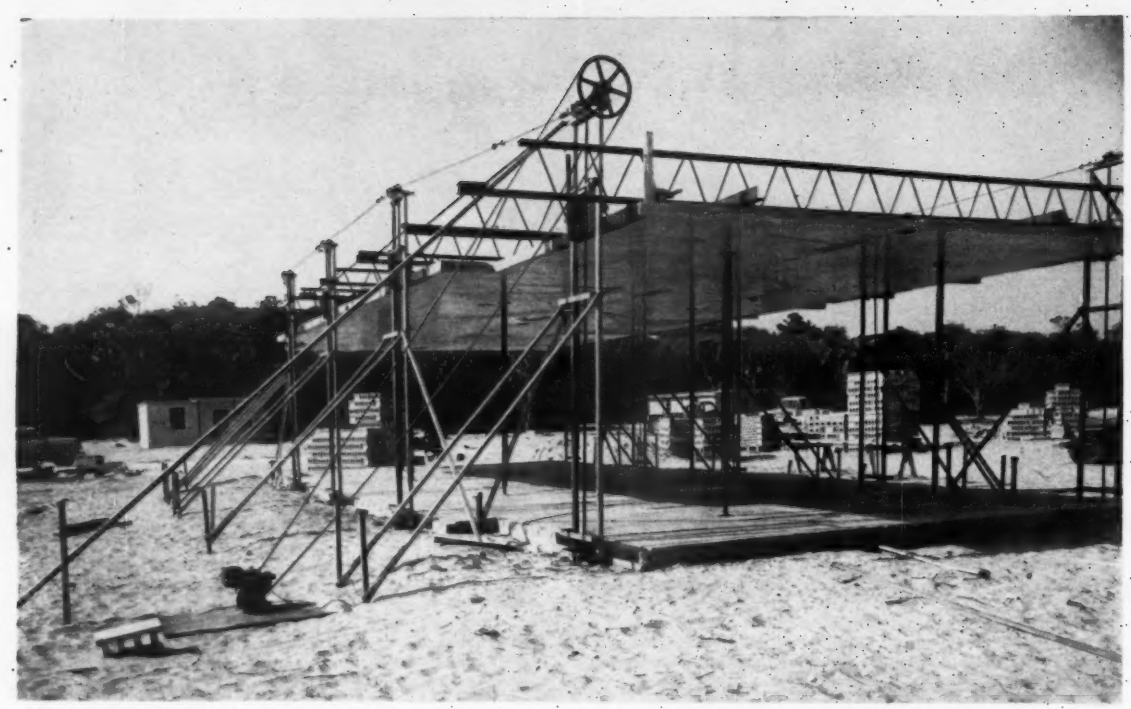

RAISING THE ROOF—A 2½-hp gasoline engine on each side of the slab provides the lifting power. Each engine turns a chain and sprocket that rotates a horizontal shaft at the top of the jacks. The shaft raises five jacks by worm gears as joists keep roof rigid.

Lift Slab Cuts Cost of Homes

LIFT-SLAB CONSTRUCTION of one-story vacation homes makes it possible for a South Carolina contractor to sell two-bedroom, concrete homes for just a shade over $4,000.

J. C. and L. D. Long, owners of Construction Service Co., figure the lift-slab technique saves them about $1,200 per home. They have built more than a dozen of these 23x32-ft, low-cost houses on the Isle of Palms near Charleston, S.C.

A well-organized operation also helps keep costs down. To prepare for pouring the floor slab, workmen smooth and compact the sandy soil. Then they place a sheet of Visqueen polyethylene film on the ground as a vapor barrier, stake down 8-in. forms, and position the 6x6-10/10 welded wire fabric that reinforces the 4-in. floor slab. Home sites have been laid out so that at this point transit-mix trucks can back up and chute concrete right into the forms.

When the concrete floor has been poured and cured, the builder places another sheet of Visqueen over it to prevent the wet concrete of the roof slab from sticking to the floor and to give a smooth, glossy finish to the ceiling. This plastic sheet is later reclaimed and used as a vapor barrier under the floor slab of another house.

Workers place 3x8-3/8 wire reinforcement and pour the concrete for the 4-in. roof on top of the floor slab, in the same forms. They then strike off and compact the concrete with a vibrating screed which the contractor made by bolting an electric vibrator to a steel channel.

Lifting the roof slab is fast and requires little costly equipment. First the men temporarily bolt steel joists over the top of the slab

POURING THE ROOF—Workers strike off and compact roof slab with a job-built electric vibrating screed. Layout of sites enables trucks to dump right into the 8-in. forms.

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— shaves contractor's estimate by 25%

TerraTrac's maneuverability, and long forward reach proved advantageous in loading out truck's in double-quick time.

Finger-tip, hydraulic control of tractor and front-hinged bucket enabled Harrison & Moore to complete finish-grading ahead of schedule.

Carving residential sites out of Utah's Wasatch Mountain foot-hills in the dead of winter was *no easy task*. Ground was frozen and filled with stones up to 12" diameter. Specifications called for a *smooth job — in a hurry* — including basement excavations, backfilling, lot-grading and leveling.

First machine to try it was a heavy-duty *conventional* crawler-loader but the owner quickly backed out, saying it was strictly a "shovel job". However, things began to happen when *Harrison & Moore*, land development and house building contractors of Salt Lake City, moved in with their 1½-cu. yd. Case TerraTrac "800". *Harrison & Moore not only finished the job entirely satisfactorily, but shaved 25% off the general contractor's estimated time.*

No track slippage — No engine stalling

Detachable grousers, combined with power-application benefits of torque-converter drive, enabled the smooth-running TerraTrac to break through frost and rocks with ease. TerraTrac grousers, which bolt on street shoes in 10 minutes with hand wrench, eliminated all track slippage, while the 80 HP diesel, with torque converter and foot-throttle control, provided the *steady power* needed to handle this tough digging assignment without engine stalling — even under the adverse grade conditions encountered.

According to partner "Arv" Harrison, TerraTrac's exclusive power-shift transmission and hydraulic power-steering were also major factors in maintaining production. Says Harrison, *"The speed and handling ease of the '800' — especially the hydraulic finger-tip shifting from one speed to another and from forward to reverse, while on the fly — is incomparable."*

Why not get *these same money-making TerraTrac advantages on your jobs RIGHT NOW*. Call your nearest Case Industrial Dealer today for full details on the size rig best suited to your needs. Also ask about the new Case financing and LEASE plans — which let you buy or rent these *new* advance-design Case TerraTrac machines *on easy monthly terms* to fit your budget.

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Contractor says, "Armco Liner Plates were an ideal solution . . ."

Alfred A. Bostow, president of A. B. C. Construction Company of California, recently said, "In some particularly hazardous areas, the use of Armco Liner Plates in tunnels was an ideal solution to our excavation problems."

He was referring to a project of the Metropolitan Water District of Southern California, involving both the A. B. C. Construction Company of California and W. C. Baker Company, a joint venture. Both firms are located at Norwalk, California.

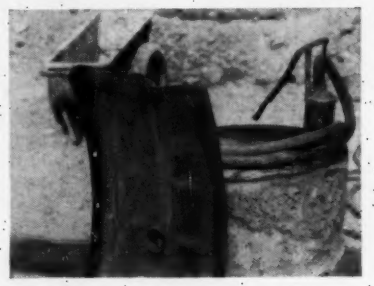
Basic project was the construction of an extensive 48-inch-diameter water line. Because of existing utility lines, tunnels were specified as conduits under numerous street crossings as well as the bed of a stream. The contractor was considering whether or not to continue the water line installation by open cut immediately at the end of the specified tunnels. Also to be considered was the fact that the tunnels would be as much as 43 feet below the surface of the street.

Continuing installation by open cutting would require engagement of a clamshell because the backhoe used in previous trenching operations had a maximum reach of 25 feet. Then too, solid sheeting would be required in the deep cuts because of unstable soil.

Considering cost factors, the contractor decided to extend the specified tunnels at each end on an uphill grade of about 20 per cent until the added tunnels were within 25 feet of the surface. Then the backhoe, being able to reach this depth, would resume open-trenching operations. However, whenever unstable soils were encountered at the 25-foot depth, the tunnel was continued until stable soils were reached.

This tunnel of Armco Liner Plates is being installed deep under Sepulveda Boulevard in Los Angeles to provide a conduit for an intersecting water line.

Close-up of Armco Liner Plate, showing bolts held in place with spring clips to facilitate bolting from inside the structure. Grout plug is welded in.

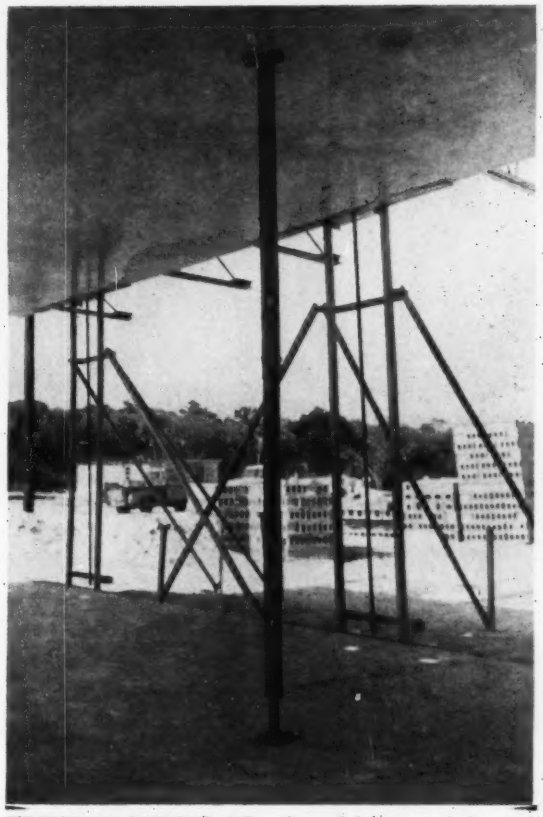


These tunnels were built with 12-gage Armco Liner Plates to form a structure 72 inches in diameter. Each curved and corrugated plate has an offset-lapped joint for extra strength. The plates, 18 inches wide, bolt together from the inside of the tunnel to form a complete ring.

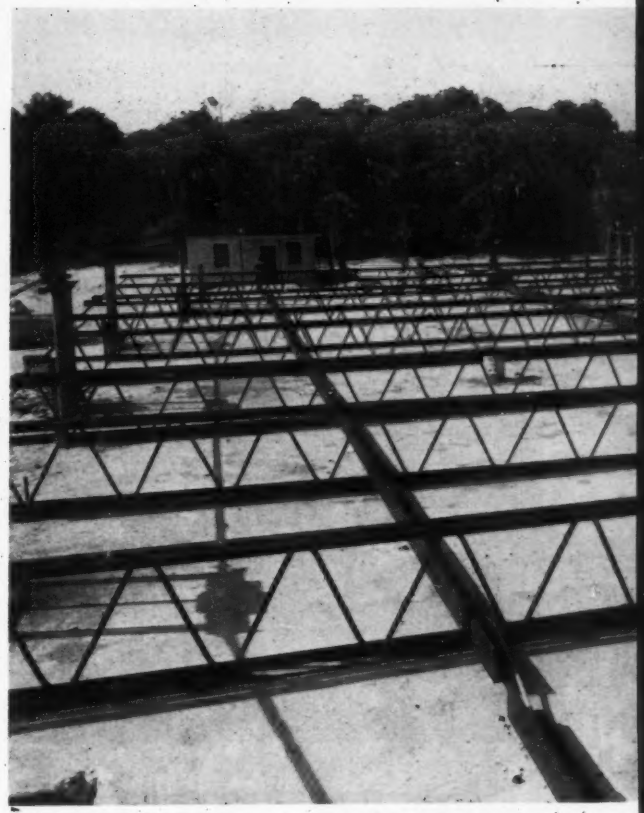
* * *

Armco Liner Plate is one of more than 30 Armco products for drainage and engineering construction. All are quickly available through competent Armco Sales Engineers who can expedite shipment from one of the 56 Armco fabricating plants. Write us for specific information. Armco Drainage & Metal Products, Inc., 5718 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

After diverting stream flow from this creek bed, a 43-foot-deep shaft was driven through the paved bottom of the creek. Through this shaft, a tunnel of Armco Liner Plates was installed.



TEMPORARY SUPPORT—When the roof slab is raised about 9 ft temporary adjustable shoring posts are placed under it for safety.



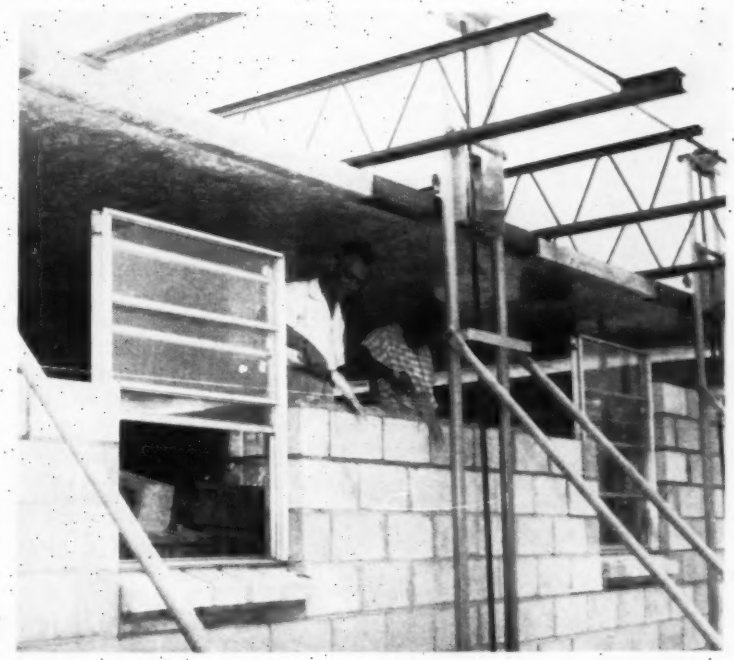
JOISTS LEND RIGIDITY—Steel joists temporarily bolted across the roof keep it rigid. Note the worm gears on top of the jacks.

to give it rigidity and keep the center level. Then they set five screw jacks on either side.

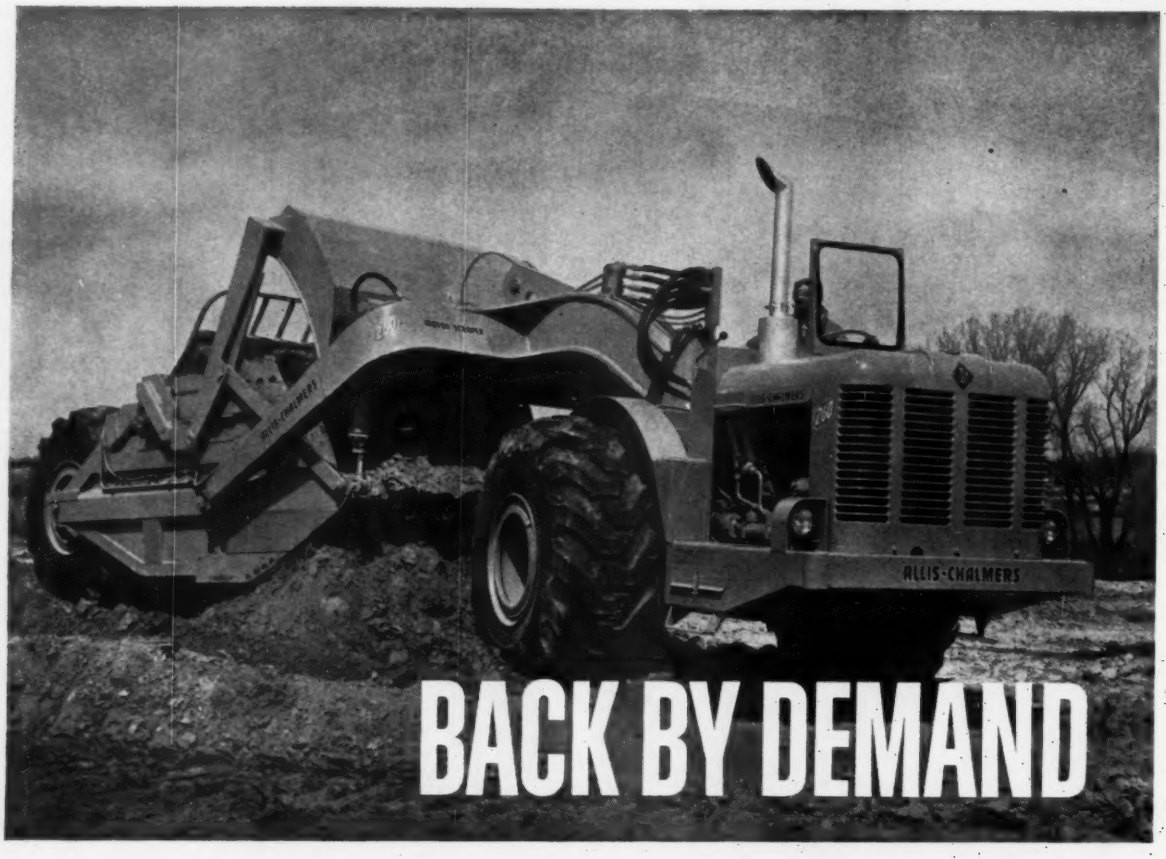
Each jack has two columns between which a threaded shaft turns to raise a small platform. The platform grips a length of steel angle that fits under the roof and does the actual lifting.

Lifting power is provided by two 2½-hp Briggs & Stratton gasoline engines—one on either side of the house. Through a chain and sprocket each engine drives a horizontal shaft located about 12 ft above the ground. The shafts turn worm gears that raise the screw jacks. These jacks elevate the 15-ton slab 1½ in. per min.

When the roof is about 9 ft off the ground, temporary adjustable shoring posts are placed under it for safety. Next, masons build the partition walls and 8-in. concrete-block exterior—usually a one-day job. Finally, the roof is lowered into place and covered with built-up layers of tar and felt. The entire job takes just two weeks.



NEARING COMPLETION—Masons build the exterior walls of 8-in. concrete blocks. After the walls are finished, the double-columned screw jacks will lower the roof into place.



BACK BY DEMAND

where big loads keep moving!

Firestone Perma-Tite Rims with unique air seal design that gives you absolute tire protection!

Exclusive Perma-Tite design makes rim completely airtight when tubeless tire is mounted, insures a *permanent* air seal for absolute tire protection. Special fusion-welding helps make Perma-Tite Rims the strongest you've ever used. Firestone Steel Products Company's balanced weld gives equal penetration throughout the section. Stress-testing results in removal of non-functional weight, allows reinforcement at high strain points. It's the truest rolling rim you can own—gives 100% tire support, reduces sidewall flexing, lets tire run cooler for longer service. Specify Firestone Perma-Tite Rims as original equipment, buy them as replacements. They're available for tubeless or tubed off-the-highway tires.

SPECIAL PROTECTION against rust and corrosion for longer rim life, better tire performance.

INTERCHANGEABLE in complete units or by components with all Earth Mover Rims and parts.

COMPLETE AIR SEAL insures retention of air at recommended pressures.

FIRESTONE STEEL PRODUCTS CO.
AKRON, OHIO

Photo courtesy of American Bridge Division, United States Steel Corporation

Handles bulky loads . . . outhauls 5 trucks!

The *Clark-Ross* Carrier pictured above hauls girders from a storage yard one mile away to this construction site. Working with another Carrier an average of 48 net tons are moved each hour. On these short runs, each Carrier is capable of outhauling 5 flat-bed trailer rigs. Reason is: the Carrier is *self*-loading and *self*-unloading.

How about a Clark Carrier for your work? One man and his Carrier can load up to 25 tons of material . . . can be on the road in the time it takes a regular truck to jockey into position. The Carrier can travel at truck speeds . . . *self*-unload. And it can handle all types of cumbersome materials.

Reports from users point up the fact that once a Carrier is used in their operation, they find that *no other kind of materials handling equipment can do the job as economically*. Let us send you some reports from the field to substantiate this. Simply write: Carrier Field Report, Clark Equipment Co., Battle Creek, Mich.

CLARK® EQUIPMENT

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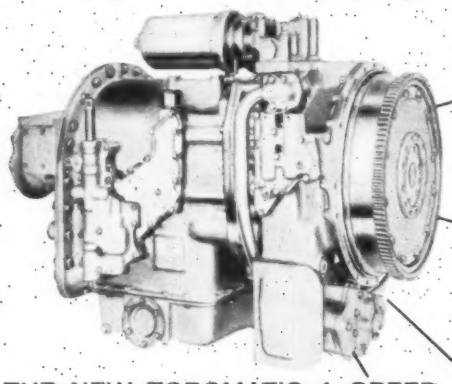
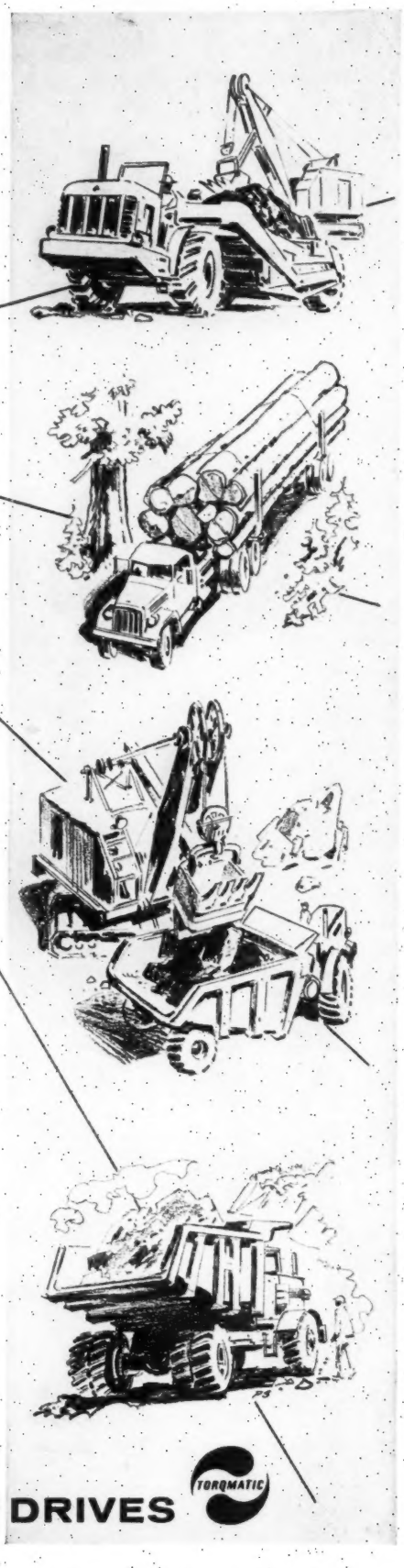
On a tough haul – it beats them all



THE NEW TORQMATIC 4-SPEED TRANSMISSION BY ALLISON



WHEREVER there's a tough job to be done—in logging, mining, highway building or dam construction—you can depend on TORQMATIC to do it better—in *less time*.

Take the TORQMATIC CBT-5640, for instance. Its converter automatically adjusts the speed and torque in any gear range—its 4 speeds forward and 2 reverse in the transmission give you an even wider range of speed and torque.

In the rough and rugged routine of mine operations—you get full-power shifts with a finger flick. The flow of power to the driving wheels is never interrupted for gearshifts.

In the deep woods, logs load out faster and safer – thanks to the TORQMATIC brake. The same oil that drives the wheels keeps them under a safe checkrein, too.

But it's in the brutal, bear-down, day-after-day grind of big construction jobs that TORQMATIC really struts its stuff. Round trips are faster because there's never an interruption of power flow while gears are shifted. And vehicles are working longer without stops in the shop, because TORQMATIC eliminates engine lugging and clutch overhauls – and the TORQMATIC brake more than doubles the life of service brakes.

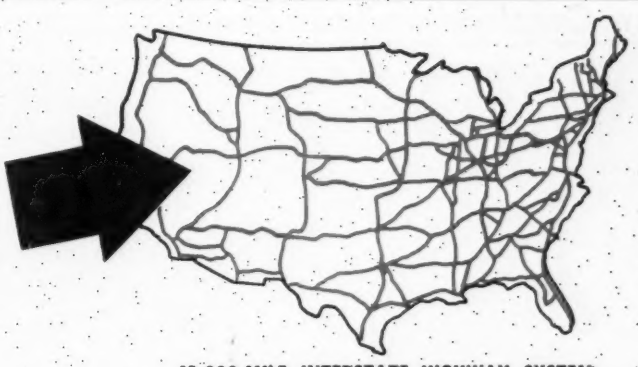
Result: longer life for engine and drive-line components with less maintenance for both.

For detailed specifications on the Allison TORQMATIC CBT-5640 or other models, see your equipment dealer or write:

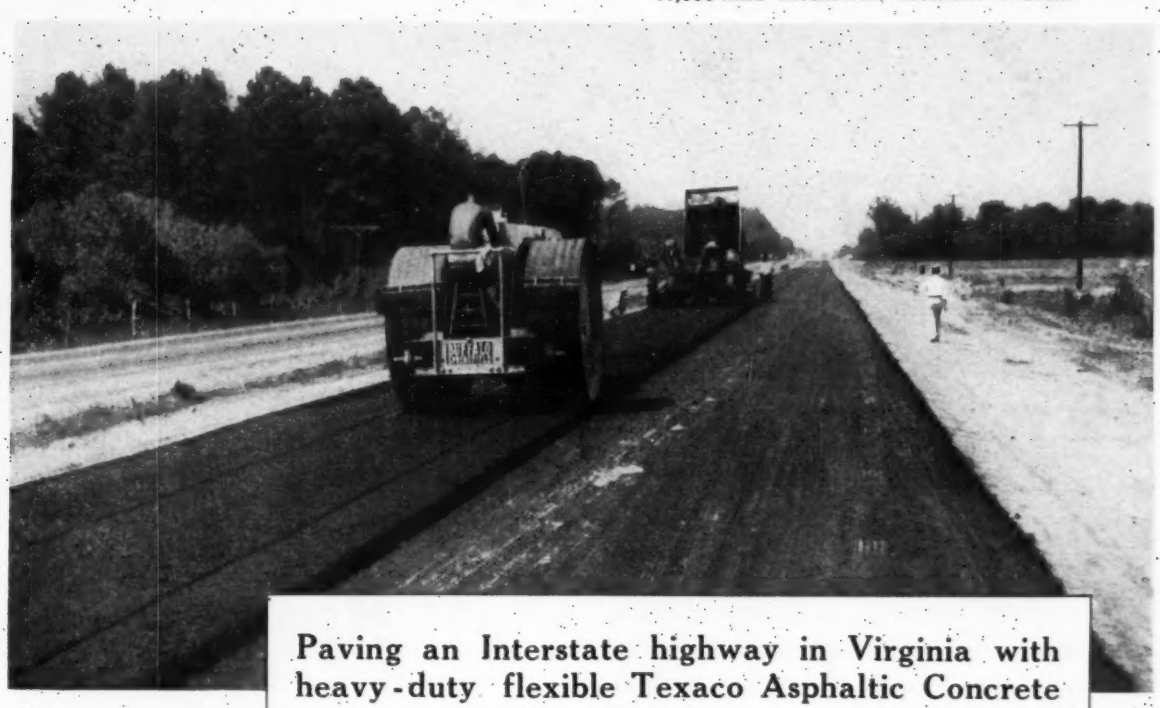
ALLISON DIVISION OF GENERAL MOTORS, Indianapolis 6, Indiana

Allison TORQMATIC® DRIVES

Another step toward this goal



41,000-MILE INTERSTATE HIGHWAY SYSTEM



Paving an Interstate highway in Virginia with heavy-duty flexible Texaco Asphaltic Concrete

The State Highway Departments are pushing ahead steadily with construction of their respective sections of the Interstate Highway System. Virginia and other States have paved a large mileage of these superhighways with hot-mix Texaco Asphaltic Concrete.

A hot-mix Texaco Asphaltic Concrete surface, on a foundation of either plant-mixed Asphaltic Concrete or Asphalt Penetration Macadam, will stand up under the heaviest Interstate Highway traffic year after year. This flexible type of construction costs substantially less than rigid paving designed for the same traffic. Maintenance costs of Asphalt paving also have been found lower by the highway departments of many States.

To the motorist, one of the chief advantages of Texaco Asphaltic Concrete paving is the velvet smooth riding quality of its resilient, joint-free surface.

Helpful information on heavy-duty Asphaltic Concrete, as well as other types of Asphalt paving, is supplied in two free Texaco booklets. Copies can be obtained without obligation by writing our nearest office.

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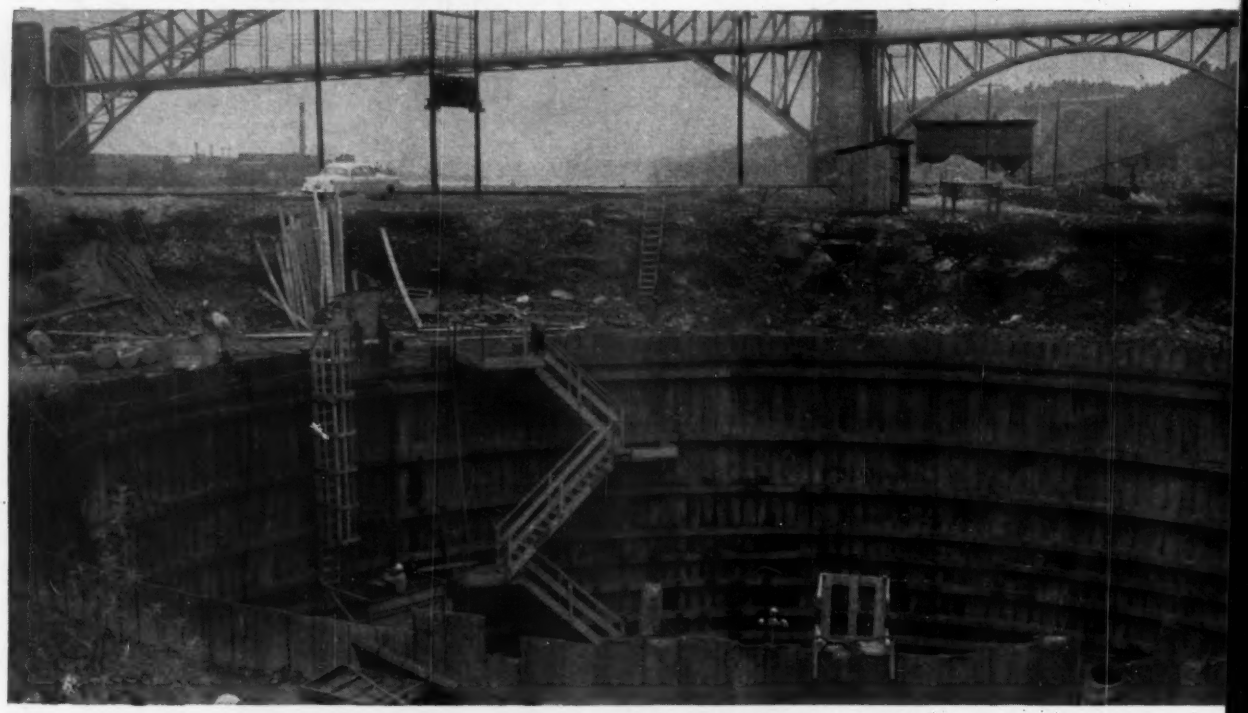
TEXACO

REG. T. M.

TEXACO ASPHALT

New Construction Idea News



110-FT. DIAMETER GIANT HOLE is braced by sectionalized 8-in. wide-flange beams, 40 lb. per ft., 21 ft. long, and bolted at the ends. The accurately curved rings by COMMERCIAL back up sheet piling driven in running ground and intermediate layers of water-bearing gravel and boulders.

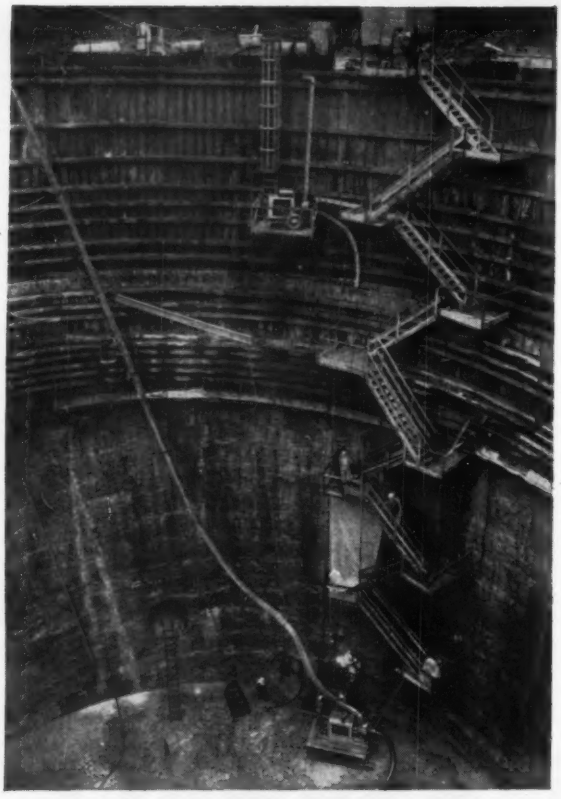


PHOTO COURTESY OF THE JAEGER MACHINE COMPANY

127-FT. DEEP EXCAVATION for the Pittsburgh pump station foundation is shored to meet developing load conditions by COMMERCIAL ring walers installed on varying centers.

Ring walers

World's largest steel-ring walers—engineered by COMMERCIAL—provide unobstructed interior working areas for giant excavations . . . speed tricky riverside foundation jobs at New Albany, Indiana and Pittsburgh.

The problem: How to excavate deep pits for two different mammoth foundations a couple hundred feet from the Ohio River—without using the time-consuming, expensive conventional lacework of jacks and vertical and horizontal braces which interferes with excavation and concrete pouring.

The solution: Use the world's largest steel-ring walers as designed, engineered and fabricated by the COMMERCIAL SHEARING & STAMPING COMPANY.

The contracting firm of McHugh, Allegheny & Drake did it on a giant, circular-shaped foundation—for a pumping station—on the Ohio River at Pittsburgh, as part of the $100-million Allegheny County Sanitary Authority project.

And it was accomplished on an even larger power station foundation—in the shape of a double cross—being built by

"A DEFINITE SUCCESS", say Charles Brooks, Project Engineer (left) and O. W. Simmon, Superintendent for Gust K. Newberg Construction Co. COMMERCIAL engineered ring walers brace their foundation excavation job — 60-ft. deep, 210-ft. long and 96-ft. wide — on the Ohio River at New Albany, Indiana.

keep large pits completely open

the Gust K. Newberg Construction Co. for the Public Service Co. of Indiana, Inc. at New Albany, Indiana.

In both cases, COMMERCIAL engineers, working with the contractors and project engineers, were able to come up with the answers which spelled faster, interference-free excavation and concrete pouring.

For the full story of how COMMERCIAL steel-ring walers were used in the cofferdam excavation at New Albany, Indiana, send for your copy of Bulletin 300-P1. If you have a similar excavation problem, or if you have a support design challenge involving a shaft, surface or subsurface tunnel project, whatever the size—large or small, we may be able to suggest an equally practical and economical solution based on our more than 25 years of experience in the design of supports for soft ground or rock excavation. Send details to Commercial Shearing & Stamping Company, Dept. B-36, Youngstown 1, Ohio.

PHOTO COURTESY L. B. FOSTER COMPANY

CURVED-WALL COFFERDAM on the New Albany power station project of Public Service Co. of Indiana, Inc. is walled by three intersecting circles of wide-flange beams fabricated by COMMERCIAL — requires only two rows of steel strut bracing.

DEWATERING—Material left in place in center section of roadway compresses underlying layer of soft, saturated clay. A ditch along each side carries off the excess water.

LOADING CLAY—Push-dozer loads scraper in cut section where sticky clay has been compressed by natural overburden. Clay loads easily when cuts are kept thin and dry.

Overburden Squeezes Water from Wet Clay

SWAMPY TERRAIN is tough country in which to build a highway; a contractor can go broke trying to keep his head above water. The difference between sinking and swimming depends on the ingenuity of the contractor.

Two contractors on adjoining sections of Route 108 now under construction south of Camden, N. J., came up with two different ways of handling the problem. Each devised a method that suited his job, and both methods are proving effective.

Gaskill Construction Co., of Riverside, N. J., has the subcontract for the earthmoving on the 3-mi northernmost section. Water here is mostly below ground, and it creates a tough problem. A layer of soft, saturated clay underlies the right-of-way.

Gaskill handled it without recourse to expensive sand drains. He dug deep ditches along both sides of the roadway, leaving material in the center section intact. The material left in place above the layer of soggy black clay forces excess moisture to escape into the ditches. Engineers figure that when it is sufficiently dried out and compressed the clay will prove to be a satisfactory foundation.

On the other job water is right on top. A large swamp sprawls over the area where a big interchange connects the new route with the White Horse Pike. The contractor on this section is Public Constructors, Inc., of Gloucester, N. J. They brought in a small dredge to remove muck from the swamp bottom.

Gaskill has the tougher problem, but it's been handled neatly. As soon as the job opened up, they started to cut the ditches. Scrapers scooped out the sandy material above the clay seam. Then a 2-yd dragline cut the clay down to below final subgrade. The outside bank of each ditch conforms to the required slope of the final section. When consolidation has reached a satisfactory stage, the contractor will simply remove the center section to complete excavation.

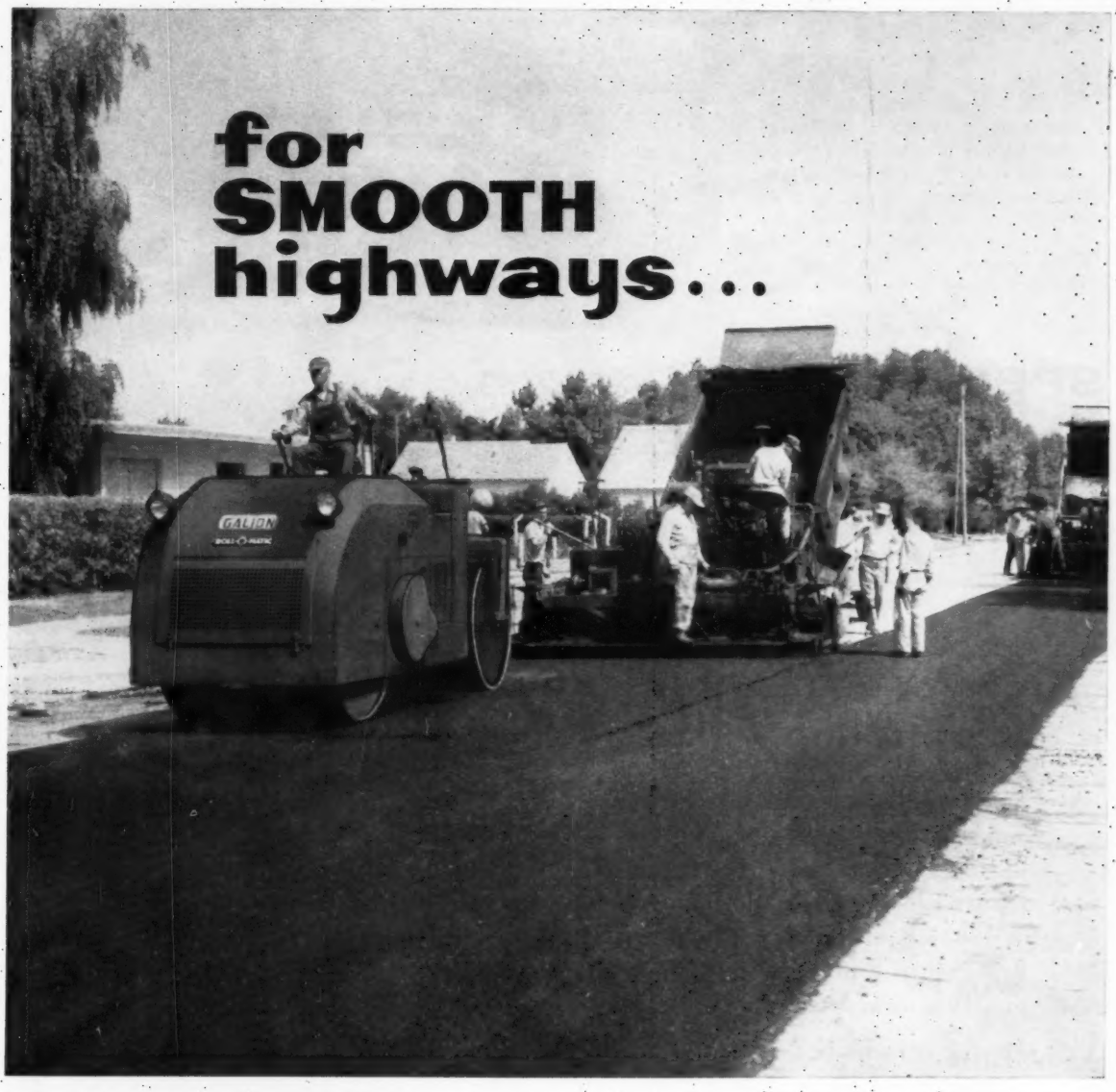
Maximum depth of the ditch is about 50 ft. Banks are steep (as high as 3 on 1) in the deeper sections but have held up well so far. Some cave-ins occurred after heavy rains, but none was serious enough to block the ditches. Gaskill cleans the ditches periodically to make sure flow is unimpeded.

The ditch along the eastern edge of the roadway takes the bulk of the flow. A small stream that meandered back and forth along the line of the new route has been diverted to this slide and accounts for most of the flow. In addition, this ditch intercepts ground water flow from the high land bordering this side before it reaches the clay seam underneath the center section.

There is less water in the ditch on the other side, but the steady trickle attests to the success of the method in dewatering the layer of saturated clay.

In a 2,000-ft-long fill section where the clay seam is close to the surface and the ground is swampy, the contractor had to put down a 4-ft-thick sand blanket on top of the muck. A borrow pit in the area provided a clean, well-graded sand that was ideally suited for this purpose. Trucks hauled the sand to the edge of the swampy section; dozers then spread it out over the area in a blanket thick enough to support equipment. As the blanket advanced across the swamp, a thin layer of coarse material was added on top to improve traction. Total quantity of sand in the blanket is about 85,000 yd.

Average depth of fill to final subgrade in this swampy section was about 5 ft, but Gaskill brought in an additional 7 ft of overburden to help consolidate the underlying clay. The sand blanket drains off the excess water that percolates up from the underlying material. The overburden will be stripped off and moved to another fill section next



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SPEEDS CAST-IRON PIPE INSTALLATION

Marcelletti & Son doubles daily production with fast-digging Cleveland

A fast-digging Cleveland 110 trencher enabled Emil Marcelletti & Son of Bedford, Ohio to make the most of the speedy pipe-laying made possible by new quick-connecting, bell-and-spigot type cast-iron pipe on this water line installation in North Ridgeville, Ohio.

Marcelletti's daily production, before putting the Cleveland on the job, had been limited because the backhoe method he was using didn't open trench fast enough to stay ahead of the swift moving pipe-laying operation. The 110 quickly doubled his daily production, on some days turning out nearly 3 times the trench footage he had been getting.

"The 110's high, reliable production and its ability to get by obstructions in narrow quarters really paid off for us on this job," says Jim Marcelletti, secretary-treasurer of the firm. "It's quick-shifting conveyor let it dig right by hundreds of trees, poles and hydrants along the trench line, obstructions that had previously slowed up our trenching operations."

accurate • fast • dependable • clean
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SLOPPY MUCK—Clamshell dumps wet material from bottom of swamp into scrapers for removal to waste area. Rig proved handy for mucking out areas dredge could not reach.

spring when the consolidation of the clay seam is complete.

After the flurry of activity this spring, Gaskill is now marking time. "It takes a long time for the water in that clay to work its way out," superintendent Levi Walton explains. "Now it's mostly a matter of waiting patiently till the stuff has been compressed enough. In the meantime, our earthmoving works is practically stalled. There's only one cut that our scrapers can work in. We won't be able to go full blast again until spring."

Only spot where equipment can work now is a cut section near the end of the job where Route 42 (Black Horse Pike) crosses the new roadway. The clay seam, which varies in consistency and depth along the line, is deeper here. The natural overburden on top has compressed it somewhat already. When cut out in thin strips and given time to dry between cuts, scraper operation in the clay is not too difficult.

Gaskill has three 9-yd LeTourneau - Westinghouse D - Tourna-

continued on page 120

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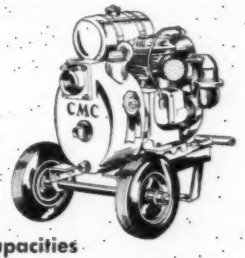
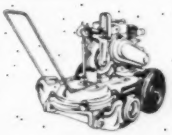
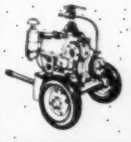
with high lift, faster priming



Capacities
4,000 to 240,000 GPH

2", 3" & 4"
DIAPHRAGMS





2", 3", 4", 5" & 6"
HI-PRESSURE Pumps

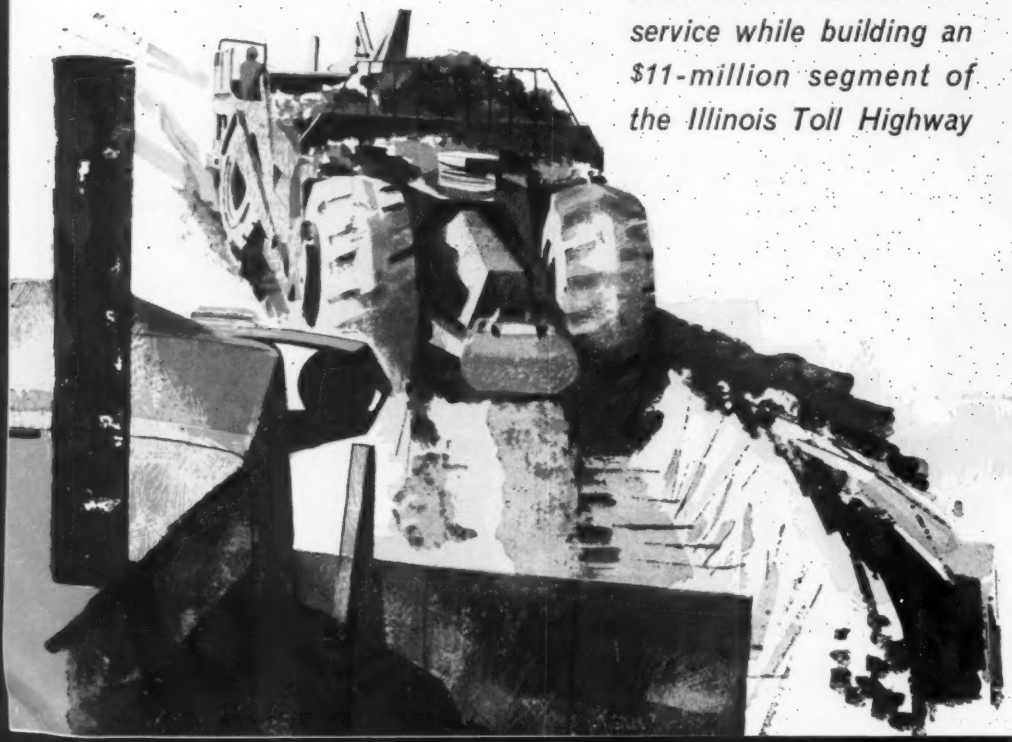
PUMPS

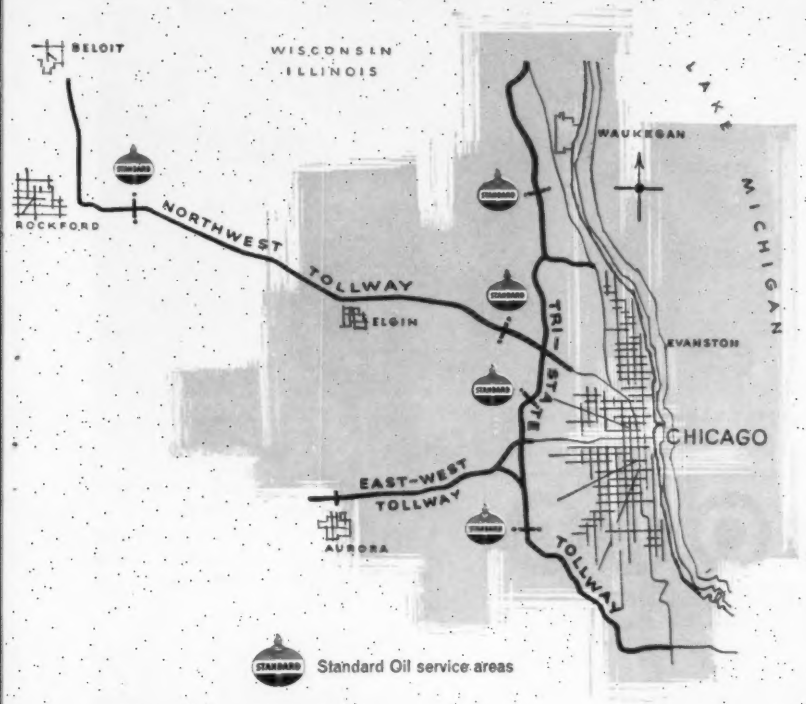
Jack Hartrick (left) and Chuck Daub (right) go over lubrication and fuel deliveries with W. D. Dillon, one of the joint venture project principals. Chuck Daub is a Standard lubrication engineer. Like Hartrick, Daub has an engineering degree plus special training for this work.

STANDARD OIL service helped this contractor on the Illinois Toll Highway

McCarthy-Mass-Dillon learn about Standard Oil service while building an $11-million segment of the Illinois Toll Highway

John Peters, purchasing agent and office manager, goes over order for supplies with Jack Hartrick. In addition to experience and training for working with contractors on jobs like this, Jack has completed the Standard Oil Sales Engineering School.





When McCarthy-Mass-Dillon was awarded the contract for 17.2 miles of the Illinois Tollway west of the Fox River, they contracted with Standard Oil for petroleum products. Here's what happened:

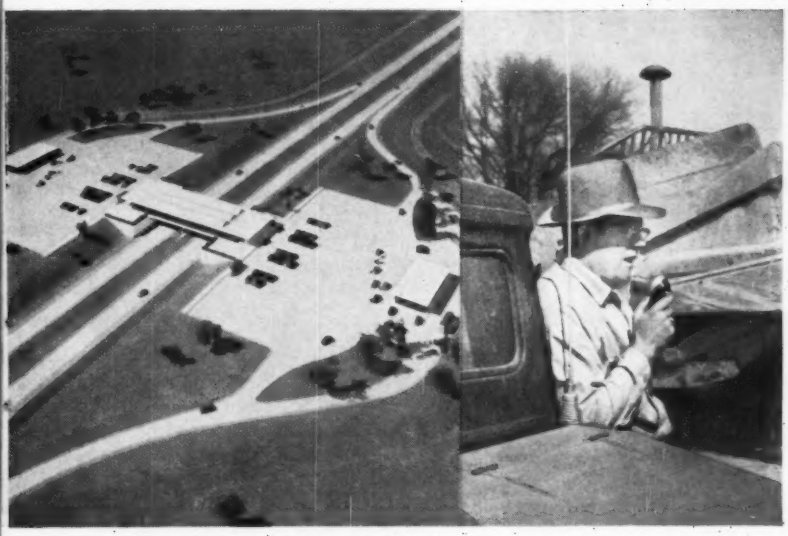
1. Jack Hartrick, a Standard Oil lubrication specialist with a degree in engineering and 11 years' selling experience with Standard, was assigned to the project. He surveyed equipment and recommended lubricating oils, greases and fuels.

2. Products able to provide lubrication over a wide range of applications plus competent recommendations by a man trained for this work resulted in the contractor having to maintain only a minimum investment in inventories. Storage and application facilities were likewise kept to a minimum.

3. Motor oil, diesel fuel and gasoline were delivered to the site from supply stations at Huntley and Rochelle, each of which is only a few miles away.

Both facilities were on call 24 hours a day. Equipment was never idle for lack of supplies of petroleum products.

This kind of service added up to money saved for the contractor. You can get this kind of service on your construction job anywhere in the 15 Midwest and Rocky Mountain states serviced by Standard. Find out how. Call the Standard Oil office nearest you. Or write **Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.**



Model of Standard Oil service plaza on Illinois Tollway. Five such units will provide service from both sides of the highway. Air conditioned, over-the-roadway restaurant will give guests an interesting view of the Tollway.

Getting the message. Howard Leonard talks to headquarters from site of Tollway interchange with Highway 31. Leonard supervises more than 150 pieces of equipment on the job—all of it lubricated by Standard Oil products.

Two motor oils, three greases and two fuels make up most of the inventory of petroleum products on the McCarthy-Mass-Dillon job. Here's the list:

STANOLUBE HD-M Motor Oil
STANOLUBE Series 3 Motor Oil
RYKON Grease
AMOCO Lithium Multi-Purpose Grease
CALUMET Viscous Lubricant
STANOLIND Diesel Fuel
STANDARD RED CROWN Gasoline

STANDARD Asphalt is used by the contractor on all shoulder construction.

You expect more from **STANDARD** *and get it!*

OVERBURDEN SQUEEZES WATER FROM CLAY...

continued from page 117

pulls working in this cut. In cutting down through the sandy material on top of the clay, the water proved to be a help rather than a hindrance. The sand loads better wet than dry. The underlying clay, on the other hand, is sticky when wet, but so far only one pusher has been needed to help load the scrapers.

The rest of Gaskill's fleet of scrapers is temporarily helping out on the next section. Work here is rolling along at a good clip. Except for the swampy area around the interchange, the water problem is not so serious. The same clay stratum underlies most of this section, too; but it is generally deeper and can be handled with scrapers like the cut section at the end of Gaskill's job. Six Caterpillar DW21's and two twin-engine Euclid TS-24's borrowed from Gaskill are giving Public a hand on their 1.5-mi section.

SLIPPERY BANK—Dozers push and pull to free scraper stuck on steep embankment slope.

Public took care of mucking out the swamp right at the start. They brought in an Ellicott Dragon dredge to clean out the 20-ft-thick layer of mud at the bottom of the shallow swamp. Two diesel engines powered the 10-in. centrifugal pump that sucked in the soggy material. Average length of the 8-in. discharge line was about 1,500 ft. The mucked out material was pumped to a waste area in another part of the swamp. The dredge worked 25 days to muck out a total of 50,000 yd of unsuitable material.

Clam shells and draglines had to take care of the tight places where the dredge couldn't reach. They loaded into scrapers that hauled the material up embankments onto the main haul roads and away to the dumping area. The scrapers sometimes got hung up on the steep, slippery side slopes of the embankments so an extra dozer was kept handy to help pull them out of trouble.

Completion of the interchange ramps that follow the mucked out strips across the swamp will wind up the tough part of Public's job. Dozers push the sandy fill material brought in by scrapers out into the mucked out trenches as the ramps advance across the swamp. Work is progressing at a good clip—no tedious hold up here for consolidation to run its slow course.

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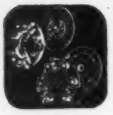
Because ROCKFORD Morlife® CLUTCHES provide 100% more torque grip than previous type clutches of equal size, they help road machines do double duty. Easier operation is accomplished by reducing the required engaging pressure. 50% better heat disposal avoids down-time caused by burned or warped plates. Numerous maintenance records prove that MORLIFE clutches operate four to ten times as long without adjustment or plate replacement. Let this NEW type clutch help keep your heavy-duty machines ON the job and OUT of the shop.



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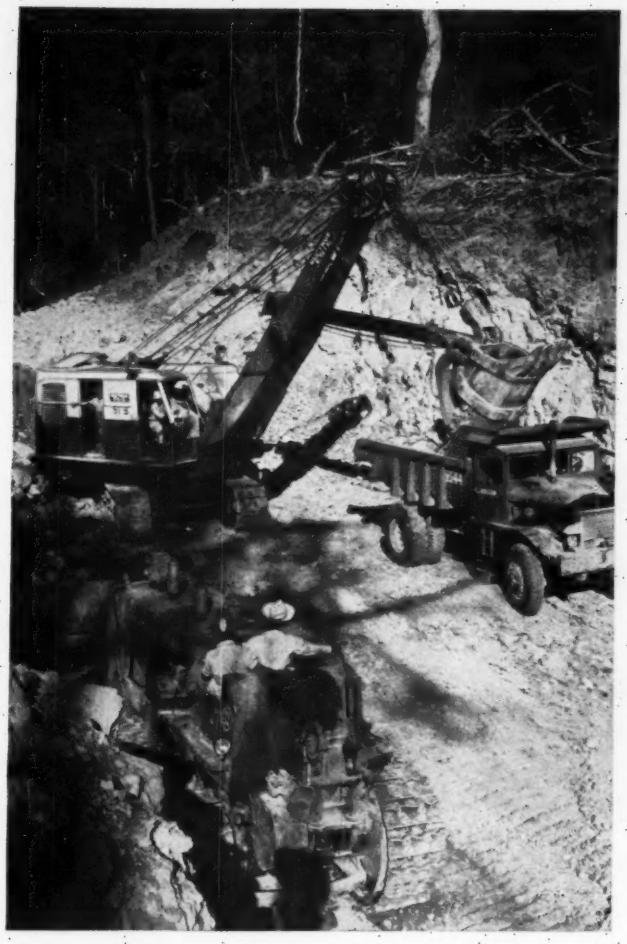
CLUTCHES

Faulty Replacements Cost Contractors Thousands of Dollars Annually in Downtime



Even though you usually do not consider the metallurgical makeup of a replacement part for your Bucyrus-Erie shovel or crane, it's an important question. But it's one you won't have to be concerned about if you buy parts from your *authorized* Bucyrus-Erie distributor.

Bucyrus-Erie spends many thousands of dollars every year in testing and developing materials for better wearing qualities under specific types of service. As a result, you get better shovels and cranes — and better parts — than were ever before available.

To make these quality parts available to you, Bucyrus-Erie Company annually *consigns* parts stocks worth millions of dollars to local distributor service shops — all built to original equipment specifications. No other manufacturer of shovels and cranes does so much to assure you of complete service.

Bucyrus-Erie also holds factory training courses to show your local distributor servicemen new ways to provide better service, new ways to make old machines perform at peak efficiency.

When you need repairs, don't gamble on "will fits". Call on the people who are best qualified and *most interested* in doing a good job. The money you save by corner-cutting may be only a down payment on losses you can suffer from breakdowns on key jobs. 2M58

BUCYRUS ERIE

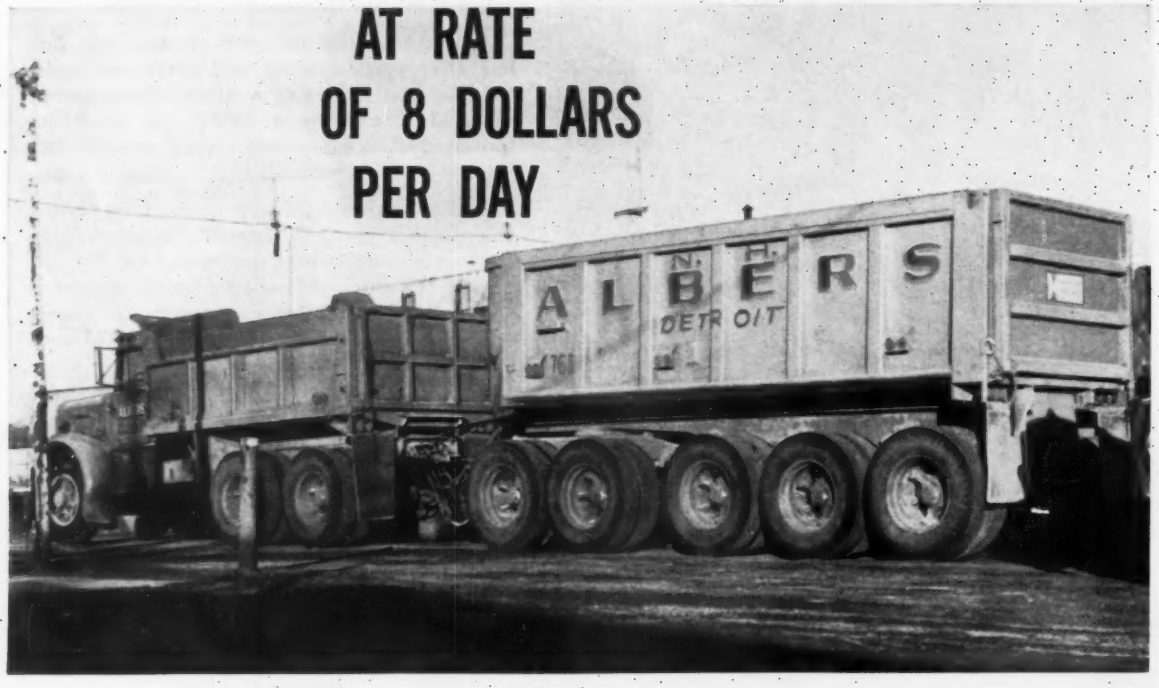
A Familiar Sign at Scenes of Progress

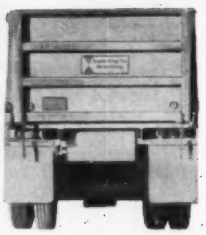
BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

At Bucyrus-Erie, specifications for molding and core sands — permeability, compression strength, etc. — are rigidly adhered to in the production of castings. Here, a laboratory technician uses an electronic meter to determine the PH (acid-alkaline ratio) of the sand mixture.

Your nearby Bucyrus-Erie distributor has a complete stock of original equipment parts for your machine. Fast follow-through on parts orders is a specialty of his. He's ready to give you speedy service right out on your job.

ALUMINUM CENTIPEDE TRAILER MULTIPLIES EXTRA PROFIT AT RATE OF 8 DOLLARS PER DAY





This 20-wheeled aluminum dump trailer, owned by the N. H. Albers Trucking Company, of Detroit, tips the scales at 1,600 pounds less than similar units built of heavier metals. Mr. W. Havel, General Manager of Albers Trucking, reports the extra payload hauled by this new aluminum unit adds up to a bonus earning of $8 every working day.

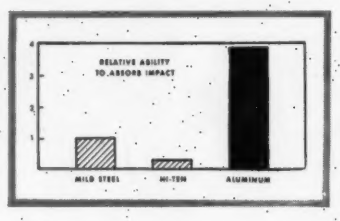
The extra payload capacity is but one of its advantages. After 60,000 miles of constant, grueling service, this durable aluminum dump trailer required *less than one hour of maintenance*, other than routine greasing and tire repair. The aluminum tail gate, unlike those on similarly constructed units of heavier metal, remained "unbowed" and good as new. Mr. Havel declares that new units to be added to the Albers fleet will all be aluminum.

The fabrication of this Alcoa Aluminum unit marks HERCULES STEEL PRODUCTS COMPANY'S initial effort in the manufacture of full aluminum trailers. Truck and trailer dump bodies built of Alcoa Aluminum alloys can multiply your earnings, too. Send for the case histories of other truckers who are operating aluminum equipment and your FREE copy of Alcoa literature. Write to Aluminum Company of America, 1879-J Alcoa Building, Pittsburgh 19, Pennsylvania.

Your Guide to the Best in Aluminum Value

Proof!
Aluminum Is Tougher!

Dump bodies built of Alcoa Aluminum alloy have three times the impact resistance of steel—at *half* the weight.



WE CHOSE ALCOA ALUMINUM MILL PRODUCTS
ALUMINUM COMPANY OF AMERICA

"ALCOA THEATRE"
Exciting Adventure
Alternate Monday Evenings

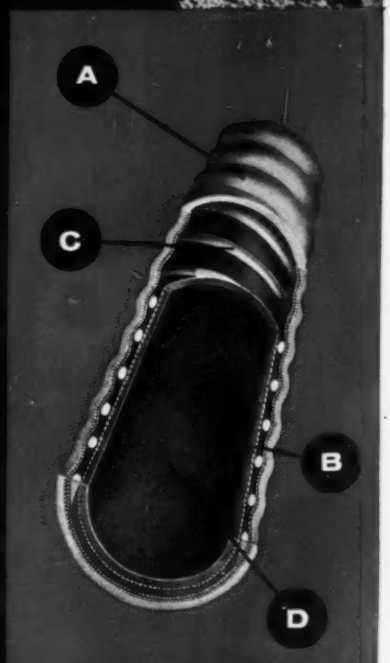
TRUCK BODY AND EQUIPMENT ASSOCIATION

Ten tons can't crush Acme-Hamilton cord suction hose

Acme-Hamilton's cord suction hose recovered its shape, and continued its suction operation even after it was run over by a ten-ton tractor rig not just once, but five times. This same hose was then subjected to a laboratory mercury vacuum test in excess of its recommended pressure without collapsing.

Check these features:
(A) Abrasion resistant red cover
(B) Cotton duck plies
(C) Rubber bonded plastic cord in 2½" and 3" sizes
(D) Smooth bore tube

Specify Acme-Hamilton cord suction hose when you order from your distributor, or write to Acme-Hamilton, Dept. HS-4.



Acme Hamilton

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INDUSTRY

MACK—one of the leading engine manufacturers using Perfect Circle piston rings for both original equipment and replacement service.

Since the early days of automotive power, great strides have been made in the development of construction machinery. We have been privileged over the years to take an active part in the development of the engines that power this equipment.

Today Perfect Circle piston rings are preferred by more engine manufacturers for original equipment and for replacement service than any other brand.

In your overhaul jobs, use the rings so overwhelmingly preferred by manufacturers—Perfect Circles! PC rings—plated with thick, solid chrome—resist wear and more than *double* the life of cylinders, pistons and rings. Records prove PC Chrome rings deliver more hours of sustained power, more hours between overhauls. Perfect Circle Corporation, Hagerstown, Indiana; The Perfect Circle Co., Ltd., Don Mills, Ontario, Canada.

PERFECT CIRCLE PISTON RINGS

Plywood panels framed with lightweight steel channels are easy to erect, and three men can strip them at a rate of 8,000 sq ft a day.

READY FOR POUR—Floor area of this four-level parking garage totals 400,000 sq ft. Concrete subcontractor saves time forming deck slabs with new prefab panel system.

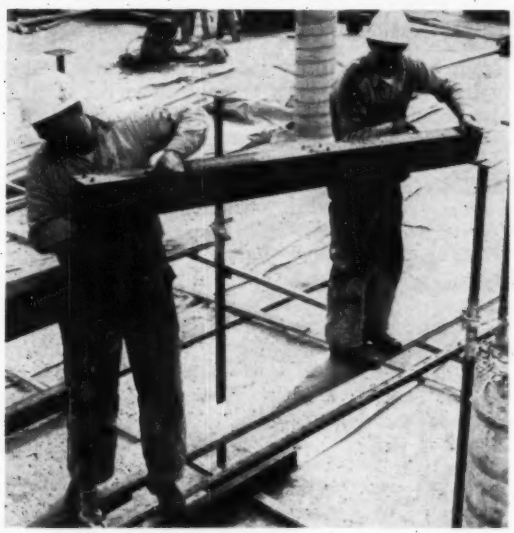
BOLTING WALERS—Lightweight steel walers brace shores in both directions.

Prefab Panels Form Concrete Deck Slab

A PREFABRICATED forming system, fitted together with locating pins, is helping Hayward Concrete Construction Co. make up lost time on concrete work for a San Francisco parking garage. A siege of rains put the contractor 15 days behind schedule, but fast erection and stripping with the prefab units has got the job back on schedule.

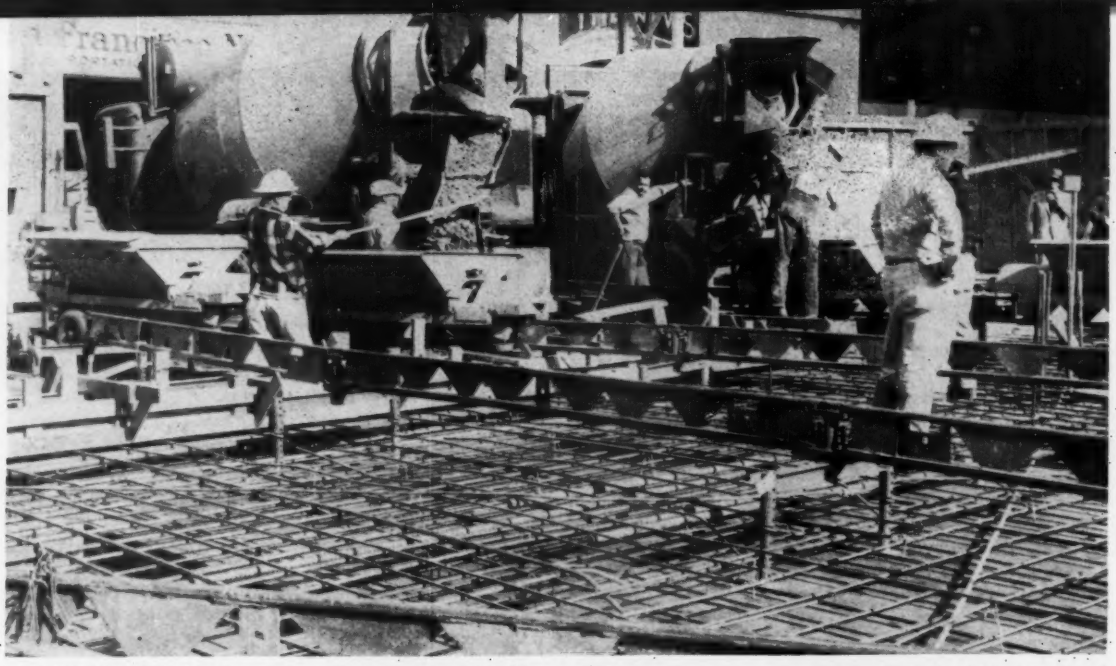
Plywood panels framed with lightweight steel channels are the heart of the system. The panels span up to 6 ft between steel stringers that rest on top of adjustable steel shores. The panels are similar to others on the market, but they are designed for use in deck slab forming as well as walls and columns. A variety of accessories makes the system extremely versatile.

Effectiveness of the system lies



PLACING BEAMS—Steel stringers span between shores and hold panels. Pins on flanges of beams fit units securely together.

ERECTING PANELS—Workmen drop panels into place on top of beams. Channel-framed panels span up to 6 ft to form deck slab.



PLACING CONCRETE—Transit-mix trucks dump concrete into ¼-yd buggies of Rex Railporter system. Five monorails fan out from loading point to cover pour area. Contractor finished concrete work on schedule despite loss of 15 days because of heavy rains.

PREFAB PANELS FORM CONCRETE DECK SLAB...

continued

in the manner in which units fit together. Locating pins project ⅜ in. from top and bottom flanges of the stringers and fit into holes in panel frames and shore head plates. The pins hold the units together and insure proper fit.

A particularly useful feature of the system is a hanger device that holds panels in place underneath the deck slab when shores and stringers are stripped. Embedded in the concrete of the slab, the hanger protrudes through a hole in the center of each panel. A wing nut on the end of the protruding portion of the anchor hook holds the panels safely in place overhead while stripping crews remove shores and stringers.

The job is a 150x665-ft building with four levels, including basement and roof, supported by 20-in.-dia columns at 26-ft centers. Floor area totals 400,000 sq ft. Deck slabs are 8 in. thick, with double curtain reinforcement. An 8-ft-square drophead, 16-in.-thick, reinforces the slab at the columns. Only walls in the structure are in the basement and along the ends of the building; the sides of upper stories are open. The interior columns provide the required structural strength.

Ordinarily Hayward would have used a conventional timber forming system on a job like this, with 4x4-in. shores, 4x6-in. stringers, 2x4-in. ribs, and ¾-in.-thick plywood deck sheeting. But General Superintendent Les Horton explains: "We were looking for something faster and trying to get away from having to burn up $50,000 worth of lumber when the job was done."

Horton saw the new prefab system in use on a Denver job by A. A. and E. B. Jones. He decided that it was just what Hayward needed and bought 42,000 sq ft of the Acrow V-forms for use on the San Francisco parking garage. The company expects they'll have plenty of chances to reuse the forms on other jobs in the area.

Panels are all 2 ft wide, but they vary in length from 2 to 6 ft, in even 1-ft intervals. Panels have a ⅝-in.-thick plywood face protected by a small angle running around each edge. Panels weigh about 7 lb per sq ft, including channel members. Support beams are 4x6-in. rolled steel sections that weigh 8½ lb per ft. Beam length generally is 8 ft.

Erection is a simple operation. Workmen lay timber sills on the floor along predetermined lines. They then set the adjustable steel shores on the sills and nail them in place. Shore spacing on this job is 6 ft one way and 8 ft the other. Slotted steel walers bolted to the shores brace them in both directions. Wood planks laid across the walers serve as scaffolding for the workmen lifting the steel support beams into place on top of the shore. Two locating pins at each end of the beam fit into holes in the shore head plates to hold the beam snugly in place. Finally, the prefab panels are dropped into position on the support beams, again with locating pins fitting the units together.

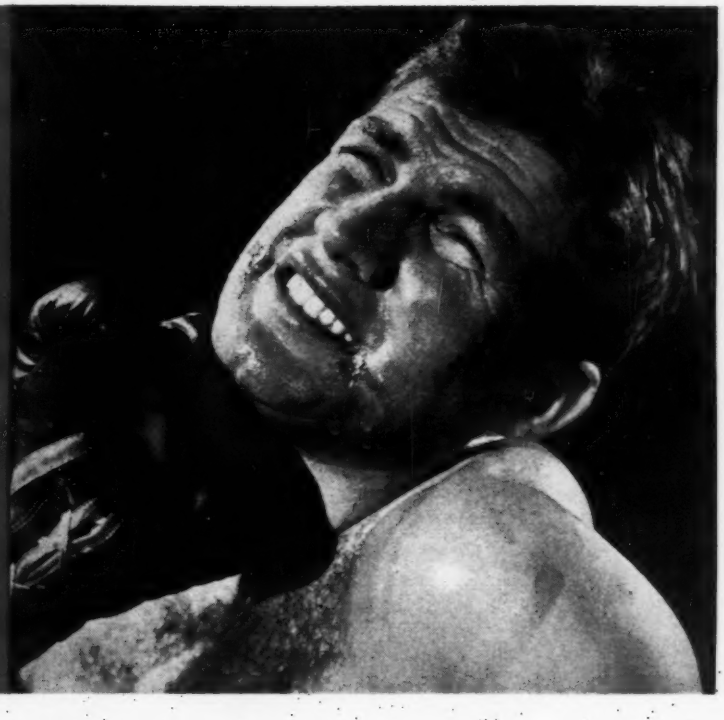
Stripping, too, goes fast. A three-man crew strips at the rate of 8,000 sq ft per day. Shores are lowered an inch or two so that the steel support beams can be lifted from the top of the shores. Two men standing on boxes made of scrap plywood hand the beams down to the third member of the team. The panels, still held to the underside of the slab by the embedded hangers, are stripped by men working from scaffolding supported on saw horses. They simply remove the wing nuts on the ends of the hangers, and the panels come free. Stripped panels are stacked on a converted Whiteman motorized concrete buggy with its bucket replaced by a wood platform. With the slotted steel walers removed from between shores, there is plenty of room for the buggy maneuver.

Forms are stripped six or seven days after a pour. Five shores are reset in each bay to hold the slab until concrete reaches full strength.

Job superintendent Jim Walker keeps 24 carpenters and 14 laborers busy erecting and moving the forms. Each six-man crew lays as much as 4,000 sq ft of the paneling a day.

continued on page 132

When the going gets tough



Amoco Superior Diesel Oil S-1 has what it takes to handle severe engine operating conditions

Amoco Superior Diesel Oil S-1 (SAE 10 to SAE 50) is a special heavy duty motor oil developed to meet unusually severe engine operating conditions where unwanted, troublesome varnish, sludge, and carbonlike deposits form on engine parts.

This product provides effective lubrication for diesel engines operated under severe conditions even when using high sulphur fuels. It is also effective in controlling deposits in certain classes of particularly severe gasoline or other spark ignition engine operations. Recommended for API Service Designation DG-DM.

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SUPERIOR DIESEL OIL S-1

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American Oil Company, 555 Fifth Ave., New York, N. Y.

AMOCO ALSO PRESENTS . . .

- Amoco HDX Oil
- Amoco Superior Diesel Oils, S-2 or S-3
- Permalube Gear Oils
- Perma-Flo Oils
- Permalube All-Purpose Grease No. 158
- Vesuvius "X" Gear Compounds

Mack 6-wheel dumpers pace the pavers on road-surfacing job. Used for a variety of heavy on- and off-highway hauling chores, these trucks, as well as Armour's other Macks, have set new performance records with . . .

down time less than

"Our contracts require us to take on all kinds of jobs, ranging from rock hauling to road surfacing to transfer of iron ore from ship to shore—and we require versatile trucks that enable us to complete these jobs swiftly and dependably.

"They're all tough requirements, but our 16 Macks have the stamina to handle these jobs . . . and they do it economically, with minimum maintenance, and less than one per cent down time," says Mr. John M. Reid, Treasurer, of Armour Excavating, Inc., of Philadelphia.

Armour is especially pleased with Mack's 20-speed transmission because it's built to give the best performance under all driving conditions, from city street to tough off-highway low-speed hauling.

Macks have what you need for dependable, profitable operation in on- or off-highway construction—maneuverability and ease of handling for fast spot-

Another of Armour's Macks dumping asphalt paving material. The combination of Mack's Balanced Bogie with Power Divider and the 20-speed transmission makes these trucks unexcelled for the roughest off-highway hauling, yet gives them the flexibility needed for open road operation.

one percent

ting and dumping; the ability to haul maximum payloads with low operating costs; and only routine maintenance requirements—sensible reasons why you can't afford *not* to operate Macks!

Your nearest Mack branch or distributor will be glad to give you on-the-job performance figures and the names of Mack users near you. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
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USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

It's a Builder's Builder

It builds what every builder wants to build . . . profits. A carryable Homelite gasoline-engine-driven Generator gives you instant power where and when you need it . . . power for electric tools and floodlights.

With a Homelite close by, your tools go at full capacity at all times. Power isn't wasted by long, hazardous cables. Your tools work faster — last longer.

Try it and see for yourself. Ask for a free on-the-job demonstration. Watch the new Homelite Generator in action. This light weight generator will operate money-saving Homelite concrete vibrators and Bosch (Germany) electric tools as well as standard universal power tools and floodlights.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

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We can quickly show you how Allis-Chalmers utility tractors can save money on every job you bid. A booklet has been prepared containing illustrated suggestions for dozens of operations . . . ways you can trim your investment and operating costs.

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D-17 54 hp, 5,300-lb weight, 140-in. over-all tractor length.
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Weights shown exclusive of companion equipment.

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Gentlemen:
I am interested in seeing your booklet about cost savings.

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SOLD BY ALL ALLIS-CHALMERS TRACTOR GROUP DEALERS: CONSTRUCTION MACHINERY, FARM EQUIPMENT, ENGINE-MATERIAL HANDLING.

REMOVING BEAMS—Workmen stand on boxes to lift beams from top of shores, which are lowered to provide clearance.

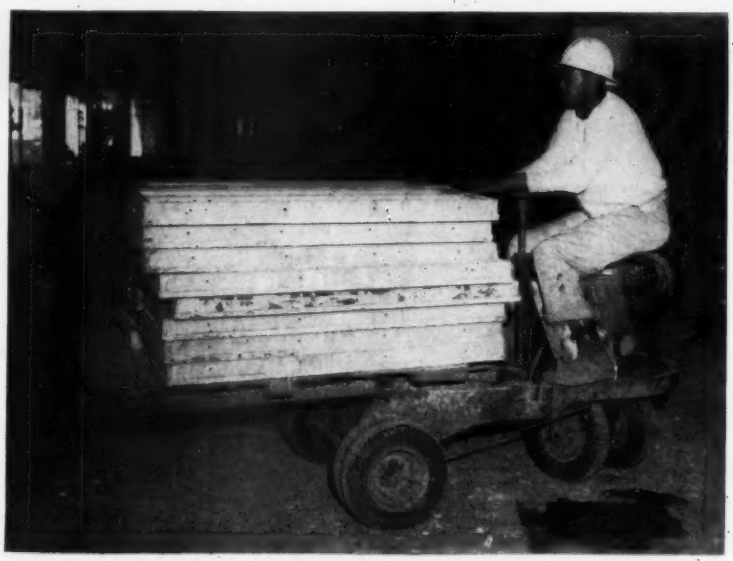
STRIPPING PANELS—Three man crew strips 8,000 sq ft of panels per day. Wing nut on end of hanger is run off to drop panels.

Concreting

A Rex Railporter with ¼-yd side-dump cars delivers concrete from transit-mix trucks to any spot on the deck. Five rails diverging from the loading point cover the floor area being poured. Concrete buggies supplement the Railporter system on the upper floors.

Hayward finished concrete work right on schedule despite delays because of heavy rains. Concrete in place totals 15,000 yd—75% in the deck slabs. Subcontract for the concrete work amounts to $700,000 out of $1.5-million total for the building.

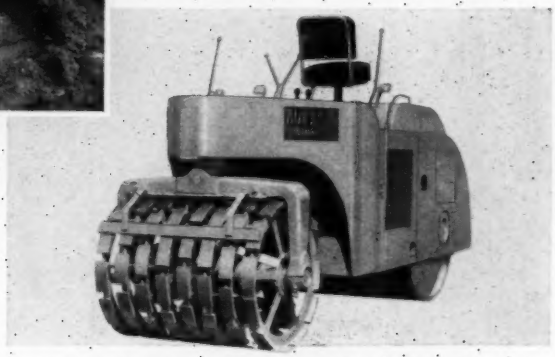
Project superintendent for the general contractor, Wm. J. Moran Co. of Los Angeles, is Dick Curtis. Jim Walker is job superintendent for Hayward, whose headquarters are in Hayward, Calif.



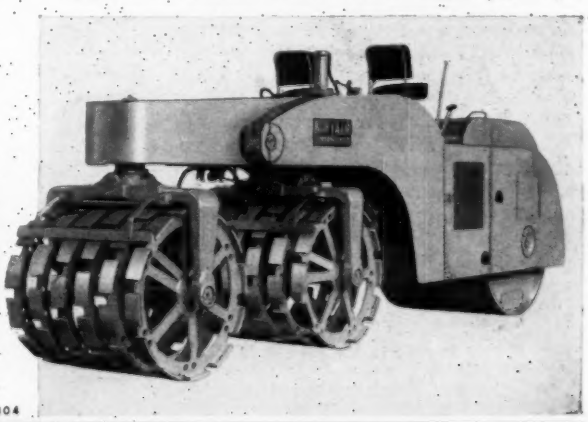
CONVERTED BUGGY—Stripped panels stacked on platform of motorized buggy are off to next pour area. Buggy has plenty of room to maneuver in clear aisles between shores.

How to get 3 to 7% GREATER COMPACTION DENSITY

With SEGMENTED ROLL you get greater and more uniform densities on earth fills, stabilized base materials, hot and cold-mix bituminous surfaces . . . in fewer passes!



NOW available in 2 sizes for all Buffalo-Springfield® 2-axle and 3-axle tandems . . . any model (from 5-ton metal weight, and up).



Quickly interchangeable . . . readily added to B-S-R rollers now working in the field.

Combining the best compaction benefits of both the projecting lug-type roller, and smooth-faced roll, Buffalo-Springfield 2 and 3-axle tandems offer you a unique method for faster, better compaction on a wide range of materials. Optional segmented roll, mounted in guide-roll position, applies pressure in a flat foot-print pattern . . . and is followed by smooth drive-roll pressure, *all in a single pass.* Result: job-performance tests show 3 to 7% greater compaction densities, as compared with conventional rolling methods.

Segmented roll is faced with staggered rows of heavy steel pads, which operate on an *"interrupted pressure"* principle of compaction. The pads individually enter loose materials with a minimum of displacement sideways or forward . . . then leave the material without disturbing compacted areas. All compaction effort is exerted in a *downward direction.* Segmented roll is, of course, readily interchanged, as your work requires. This is a real time-and-money-saving opportunity worth looking into! Better call your Buffalo-Springfield distributor about this right away.

B804

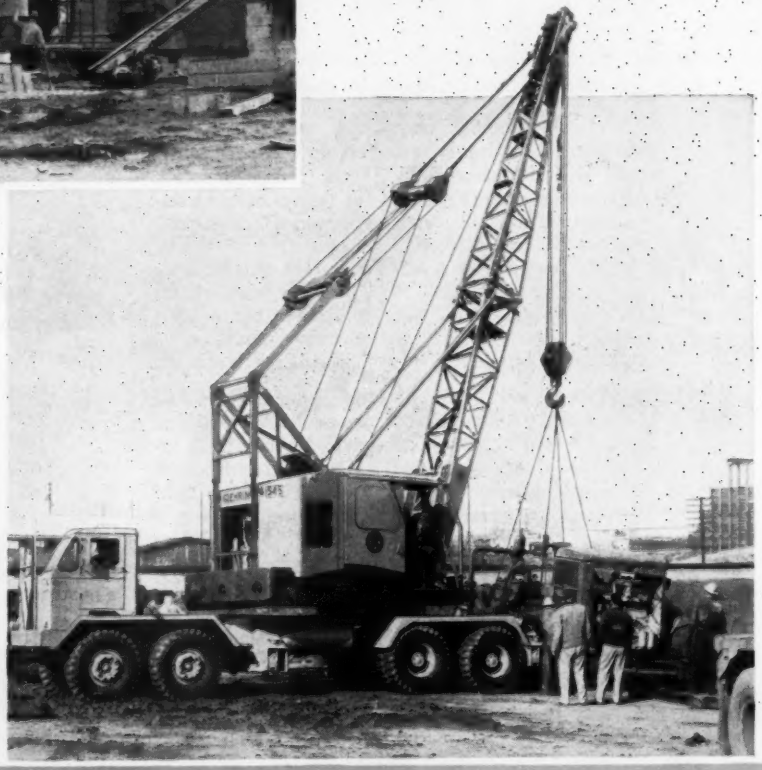
BUFFALO-SPRINGFIELD ROLLER CO.

SPRINGFIELD, OHIO • DIVISION OF KOEHRING COMPANY

KOEHRING WORK CAPACITY on rubber...

Heavy church pillars, and elaborate pre-cast concrete base and cap sections received careful, precision handling with this Koehring® 205 Cruiser® crane on the job. Carrying 65-foot boom, it set up row of tall columns at church entrance, and helped erect steeple and high, arched roof. *One man* controls all operations — *one engine* supplies all power for work and travel on this 205 Cruiser. There's a full range of working speeds up to 7 mph — *plus travel speeds up to 21.5 mph!* Has torque-converter on 4-wheel drive, automotive power-steering, 27½-foot turn radius, 30% gradability. *Lifts up to 15 tons.* Boom lengths: 25 to 70 ft. — or max. 95-ft. boom-and-jib. Highway travel unrestricted. Overall width, 8 ft. Axle-load distribution meets highway regulations in most areas, even when carrying 25-ft. folded boom.

A large companion-model Cruiser has just been added to the Koehring line — new 305, with 25-ton lift capacity, and travel speeds up to 18 mph.



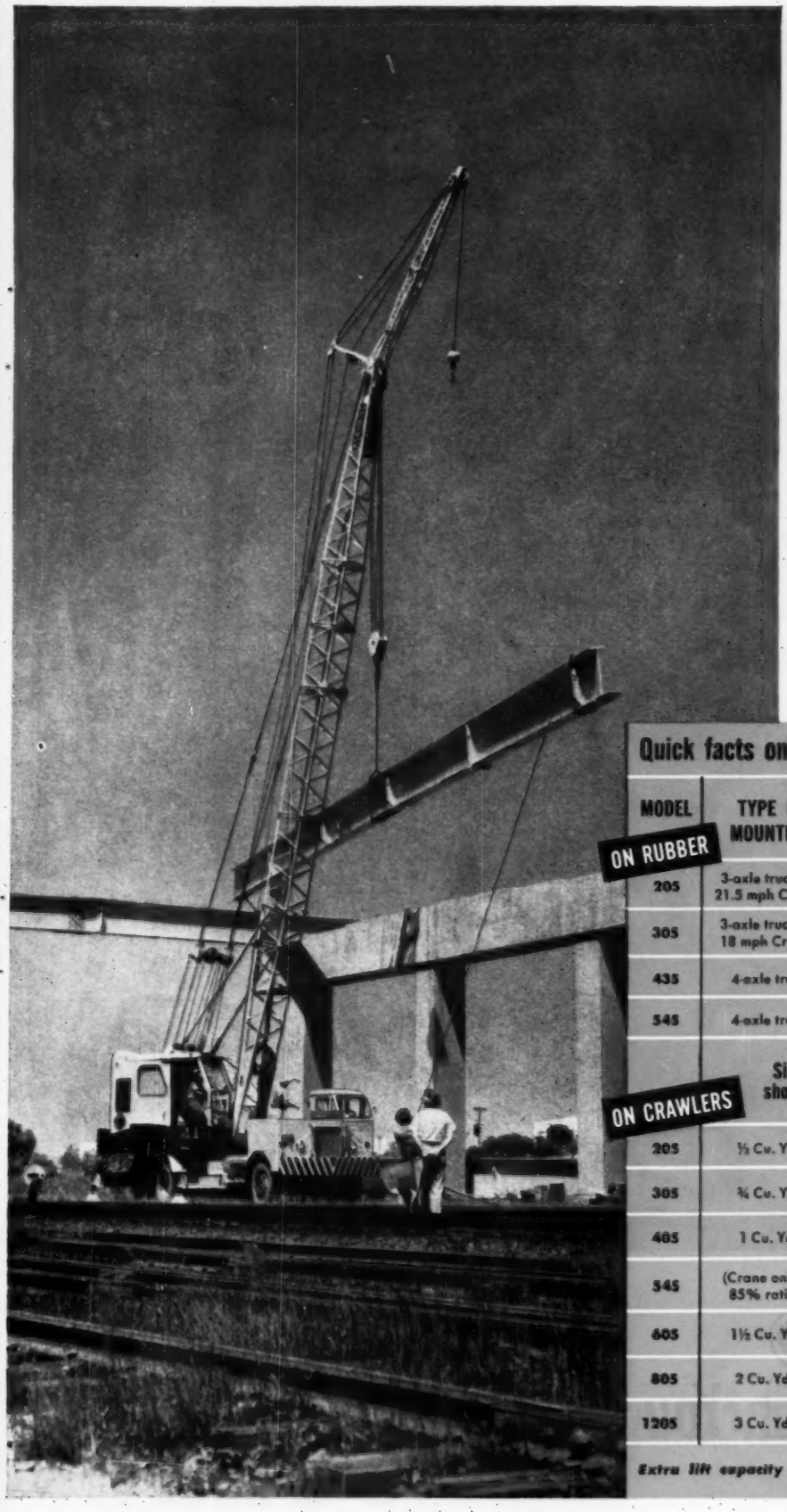
45-ton handyman — To unload and place skid-mounted mud pumps, engines and other machinery for a new oil-field installation, a big 545 truck crane (right) was put to work. Heaviest load was 23 tons — an easy lift for the Koehring 545! In fact, it can pick up 45 tons with 40-foot boom *at 15-foot radius.* On high-lift work, it handles up to 120 feet of main boom — or 150 feet of boom-and-jib. Removable counterweight, boom and outriggers reduce machine weight — give quick conversion from fully-equipped crane to roadable machine for highway travel. Top road speed on mobile 545 is 31.8 mph.

All models on rubber and crawlers are listed in chart on next page. Pick the size that best suits your needs — then ask Koehring distributor to demonstrate it. Call today.

KOEHRING DIVISION OF KOEHRING COMPANY, Milwaukee 16, Wisconsin

Koehring excavators and cranes also manufactured in: CANADA • ENGLAND • SPAIN • JAPAN

K030

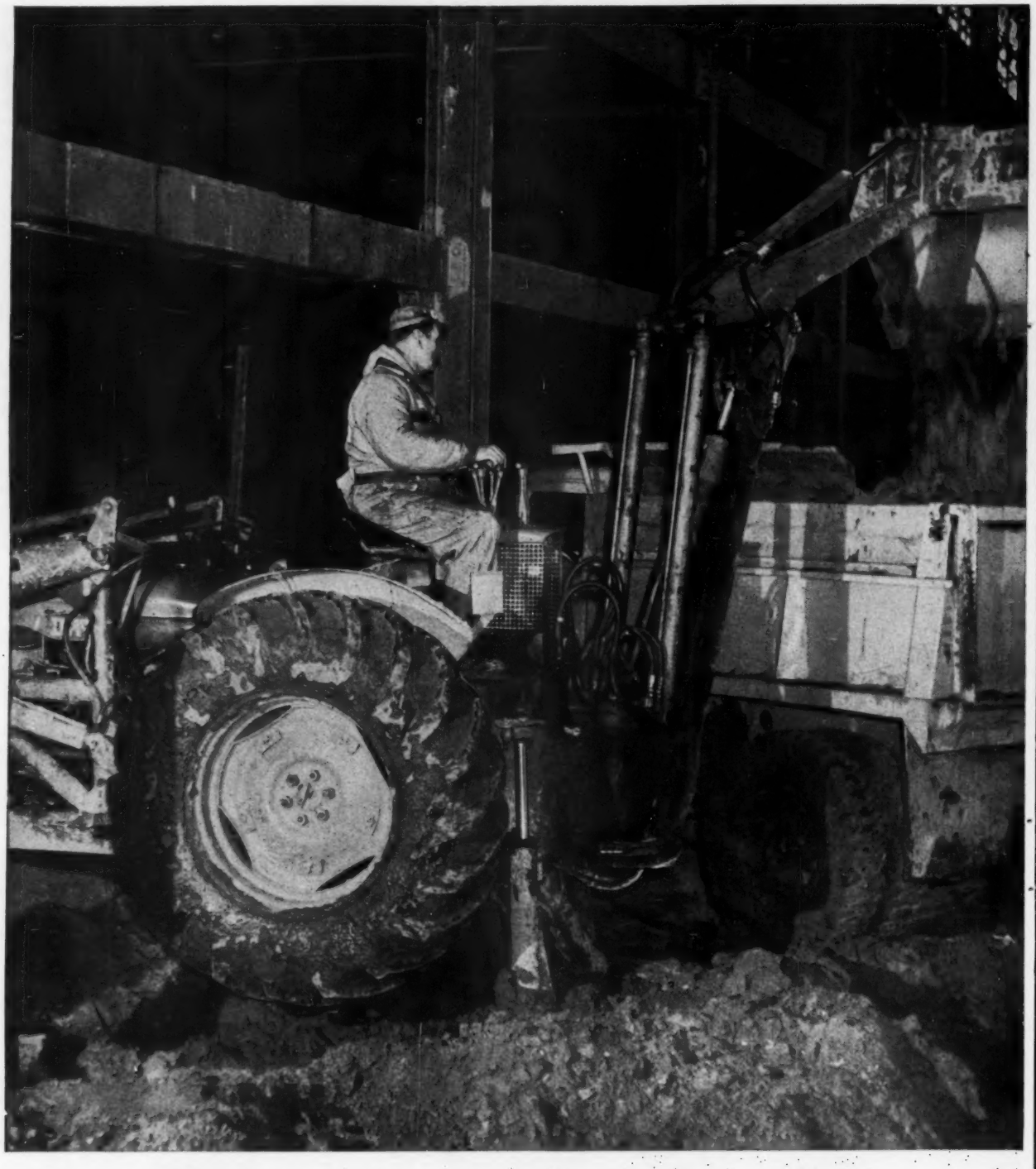


Highway overpass—Look at the reach of this Koehring 305 truck crane setting steel girders on a new bridge. It's handling the heavy loads off the end of a 60-foot boom — and carries a 15-foot jib for the extra-high lifts. But that's not the limit of its reach. This truck-mounted 305 can raise up to 100 feet of main boom, or maximum 130-foot boom-and-jib, *with low A-frame!* Butt-connected boom is safe — solid. Inserts are easily changed. Only 2 bolts per corner. Lifting capacity of 25 tons (see chart) increases *work capacity* with all attachments. As a clamshell or dragline, truck-mounted 305 handles ¾ to 1-yard buckets, converts to ¾-yard shovel or hoe. Also available on crawler mounting — *or as an 18-mph self-propelled Cruiser crane.*

Quick facts on KOEHRING WORK CAPACITY:

MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER			
205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
305	3-axle truck, or 18 mph Cruiser	50,000 lbs.	at 12-ft. radius
435	4-axle truck	70,000 lbs.	at 15-ft. radius
545	4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
205	½ Cu. Yd.	20,000 lbs.	at 10-ft. radius
305	¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
405	1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
545	(Crane only — 85% rating)	90,000 lbs.	at 12-ft. radius
605	1½ Cu. Yds.	72,300 lbs.	at 12-ft. radius
805	2 Cu. Yds.	104,200 lbs.	at 12-ft. radius
1205	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

Extra lift capacity means . . . ***MORE WORK CAPACITY WITH ALL ATTACHMENTS***



Ford
TRACTORS AND INDUSTRIAL EQUIPMENT

You see more **FORDS**

Flint, Mich., Job Report:

Fordson Major Diesel works "Low and Inside" for 75¢ a day!

FLINT EXCAVATING COMPANY of Flint, Michigan, contracts over a half-million dollars of work a year digging footings, trenches, basements, parking lots, etc., and doing small-road building. The company has been using Ford Tractors and Equipment for four years, and is especially sold on the powerful Fordson Major Diesel.

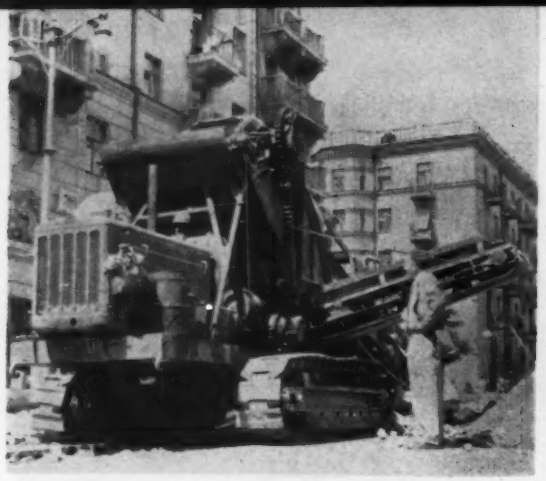
MR. H. P. PACE, one of three partners in the company, says: "We've always been pleased with FMD fuel and maintenance economy, and we find for our work it has plenty of power, and more. But one of the biggest things it offers us is a compact, maneuverable source of power for inside digging and loading."

VETERAN OPERATOR BERT DEKALB, JR. says: "I do a bit of everything with it. Dig footings. Dig pits for machinery. Pull concrete trucks out of the mud. All kinds of loading and backfilling. I can dig, set and backfill a 3000-gallon tank in 4 or 5 hours."

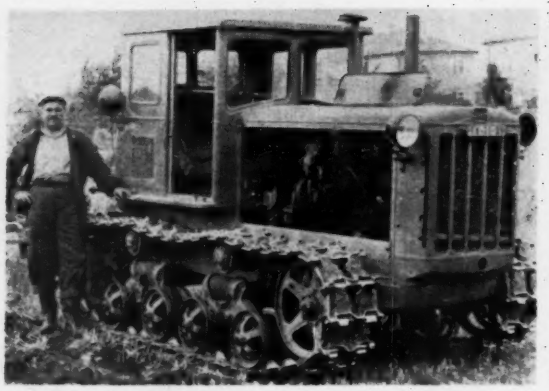
FUEL CONSUMPTION? "Five gallons of No. 2 diesel fuel see me through an 8-hour day," says Mr. DeKalb. "At 15 cents a gallon, that's operating for practically nothing!"

FORD TRACTORS AND EQUIPMENT are helping to make happy operators and prosperous owners on all kinds of construction jobs all over the country. Get the *full* Ford story today from your nearby dealer, or write to: Tractor and Implement Division, Ford Motor Company, Birmingham, Michigan.

because they save more money!



LOOKS FAMILIAR—Vern Schield views Russian ladder-type trencher as it digs 10-ft deep trench. It has rubber belt.



STANDARD CRAWLER—Most popular Russian machine is 54-hp crawler tractor. Big Stalingrad factory turns out 75 machines a day.

WOMEN POWER—In Leningrad, which is undergoing building boom, Russian women with pick and shovels feed material into reach of old-fashioned backhoe that is filling sewer trench. Newer Russian excavators are designed along American lines.

Russians Build Simple Rigs

RUSSIAN construction equipment is soundly engineered and well produced, "but it has a long way to go to match American rigs for their high production capabilities," says Vern Schield, chairman of the board of Schield Bantam Co.

In a new booklet describing his experiences on a trip through the Soviet Union, Schield says, "the Russians have come a long way in a short time, but I didn't see any road building equipment that compares with what we have in this country."

In Stalingrad, Schield toured one of Russia's largest crawler-tractor plants. This plant manufactures just one basic model—a four-cylinder 54-hp diesel crawler. With 15,000 workers—38% of them women—this plant turns out 75 tractors a day.

Engineering was good but simple, according to Schield. Virtually all castings are riveted—not welded—to a heavy 8-in. channel steel main frame. A hydraulic system operates attachments. While outmoded by American standards, this rig is the backbone of Russian construction operations. Schield purchased one of these tractors for display purposes before leaving Europe.

At a Moscow industrial exposition Schield saw eight crawler tractors of various sizes, including one model about the size of a Cat D8. But many machines were labeled "pilot models of things to come," which indicated that much of this equipment was not in actual production. Another machine on display was a 7-yd electric shovel.

The most popular Russian excavator is a ¾-yd machine that resembles early American excavators. Like most Russian equipment, this machine is powered by a long-stroke, slow-speed diesel—in this case a four-cylinder unit. Gear drive from the engine to the jackshaft is enclosed and drum and swing shafts are mounted on ball bearings. The crawler assembly is similar to those on American machines.

What in Russia impressed Schield the most? The 32-story Moscow University—tallest building in all of Europe or Asia—which is turning out thousands of well-trained engineers yearly.

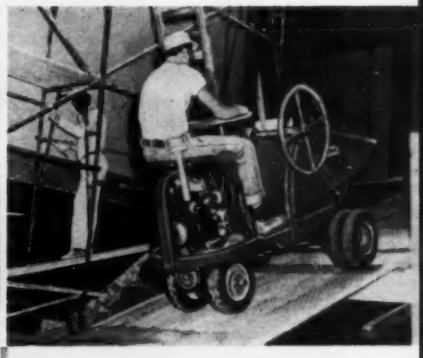
Whiteman POWER BUGGIES®

Concrete, bricks, blocks, pipe, mortar, lumber, forms, millwork . . . there's a Whiteman Power Buggy to haul every type of material faster, better, cheaper. 8 models with various interchangeable body types. All are sturdy, tireless workers, priced to quickly pay for themselves. Job-proved in rugged use for over 12 years. Call your Whiteman dealer or send coupon now.

a model for every job!

FORK LIFT
Here shown lifting a form into place. Moves palletized block, brick, mortar, etc. with ease. Lifts to 7' 10". 1000 pound capacity. Bucket body is interchangeable.

FLAT BED
Hauls lumber, forms, pipe, millwork and countless other materials. 44" x 48" or 44" x 60" bed. Stakes or side boards optional. Bucket body is interchangeable.



DUMP BUCKET
Fastest, cheapest way to place concrete. Carries 13 cubic feet. Speeds up to 16 mph. Climbs 20° grades. Controlled, accurate pour. Standard of the industry.

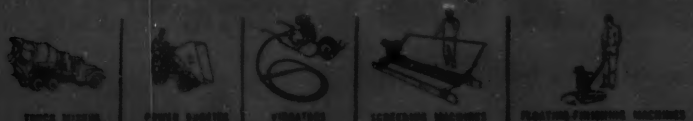
WALK-OR-RIDE
Efficient way to place concrete and haul bulk materials. Operator walks or rides. Travels narrow runways, thru 31" doors. Flat bed interchangeable.

PALLET LIFT
For fast, efficient hauling of palletized mortar, block, brick, bags, etc., where high lift is not required. Saves handling and man hours.

UTILITY
Does a multitude of hauling jobs. Large 44" x 60" flat bed. 54" wheelbase. Drives from front end. Also available in 38" wheelbase for towing. (shown)

Whiteman

THE LEADER IN CONCRETE EQUIPMENT



WHITEMAN MANUFACTURING CO. Dept. C
13020 Pierce St., Pacoima, California

Please send prices, catalogs and name of distributor for:

- ☐ Power Buggies
- ☐ Screeding Machines
- ☐ Floating-Finishing Machines
- ☐ Vibrators
- ☐ Truck Mixers

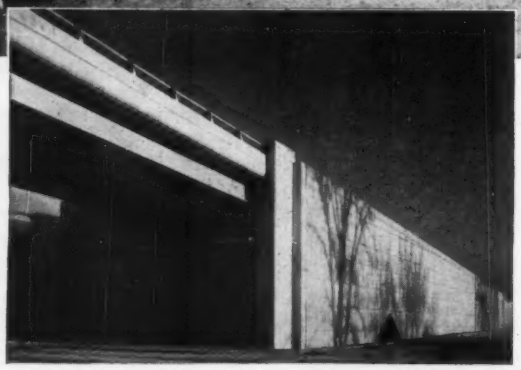
Name _____

Firm _____

Address _____

City _____ Zone ____ State _____

FIR PLYWOOD ON CALUMET



Big prefabricated fir plywood form sections helped cut costs, speed work on 8-mile long Calumet Skyway.

CALUMET SKYWAY TOLL BRIDGE LOCATION:
West end of Indiana Toll Road to downtown Chicago

COORDINATING ENGINEERS:
De Leuw Cather & Company

CONTRACTORS FOR FORMWORK:
R. R. Anderson Co., Chicago
Arcole Midwest Corp., Skokie, Ill.
M. J. Boyle & Co., Chicago
J. M. Corbett Co., Chicago
Kenny Construction Co., Skokie, Ill.

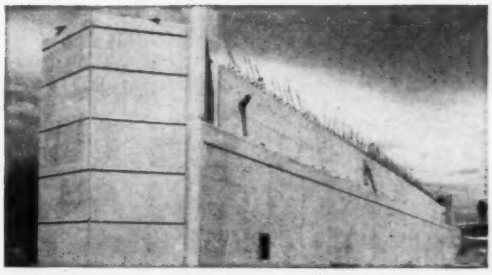
FORMS SPEED CONCRETING SKYWAY TOLL BRIDGE

GIANT FIR PLYWOOD FORM SECTIONS, as large as 28′ x 31′, played an important role in keeping work moving at a near record clip on the new eight-mile long Calumet Skyway which links the Chicago business district with the Indiana toll road.

The job features one of the world's longest retaining walls along three of the eight miles. Over 30 feet tall in places, the wall was formed by leap-frogging the big prefabricated plywood form sections. In most instances, forms were built to maximum wall height and simply cut down for shorter walls. Plywood forms were also used for abutments at street crossings and for beams and bridge decks on overpasses.

Plywood was called for in the job specifications for uniformly smooth concrete, but contractors on the job credit plywood's ease of fabrication and handling—coupled with a high number of re-uses (up to 15 or 20 pours)—with holding down costs as well.

All told, over 300,000 square feet of plywood forms were used by the five contractors concerned with pouring walls, abutments and decks.



Rustication lines on walls and abutments were achieved by nailing strips to face of plywood forms.

Fir plywood was also used for forming reinforced concrete beams and deck slabs on entrance ramps.

DOUGLAS FIR PLYWOOD ASSOCIATION

TACOMA 2, WASHINGTON

—a non-profit industry organization devoted to research, promotion and quality control

DFPA TESTED QUALITY

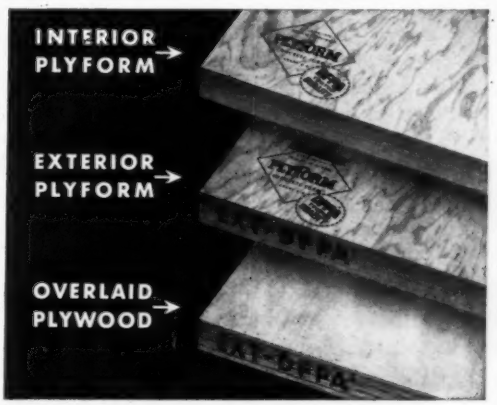
ALWAYS SPECIFY BY DFPA GRADE-TRADEMARKS

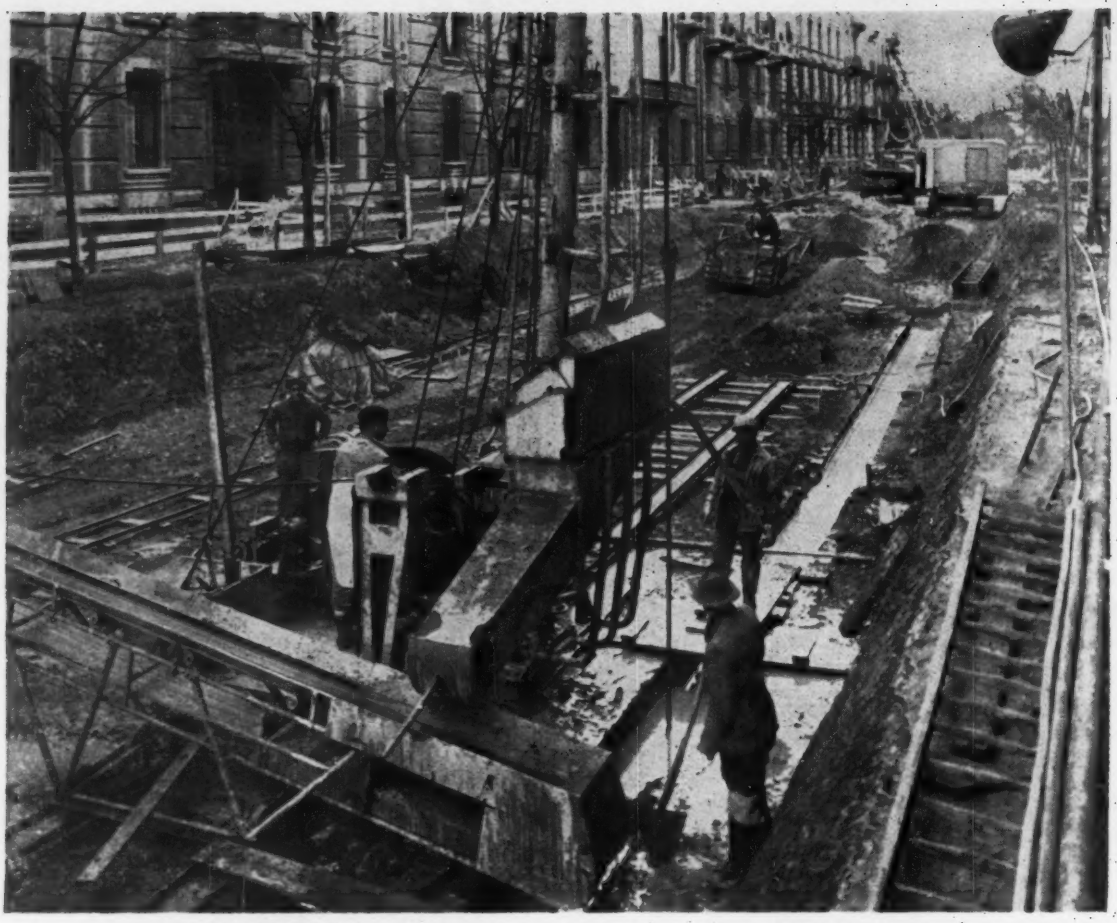
Letters DFPA indicate material has been inspected and tested under rigid DFPA-Industry quality control program. Grades manufactured expressly for concrete form work include:

INTERIOR PLYFORM®—standard concrete form grade plywood made with moisture-resistant glue. Gives multiple (10-12) re-uses.

EXTERIOR PLYFORM®—standard concrete form grade plywood made with waterproof glue to give as many as 25 or more re-uses.

OVERLAID PLYWOOD—special panel with hard, glossy, plastic-like fused resin fiber surfaces. Forms smoothest concrete; up to 200 re-uses.





OPEN-CUT TUNNEL—Italian contractor digs narrow trenches along each side of cut, fills the trenches with Bentonite mud, then tremies concrete into the trenches displacing mud.

Mud Braces Trench Walls

DIGGING trench walls close to tall buildings normally is a treacherous job. But an Italian contractor has worked out an inexpensive method that eliminates all costly bracing.

Ferrobeton G.U.S. digs a trench to the required wall depth, fills the trench with Bentonite mud (a soft porous clay formed from volcanic ash), places reinforcing steel, then fills the trench with concrete.

The gelatin-like Bentonite braces the trench walls until the contractor is ready to pour concrete. Then, concrete displaces the mud, forcing it to the surface where it can be reclaimed.

Ferrobeton devised this method while building portions of the Metropolitana Subway in Milan. The semi open-cut tunnel runs for a total length of 1½ mi. It is 25 ft wide and the tunnel arch stands 10 ft below street level. But concrete bulkheads have to go down 27 ft.

Where buildings pose no problems, Ferrobeton builds walls in the open-cut excavation. But when the tunnel work passes near tall buildings, excavation is limited to shallow trenches. There Ferrobeton switches to the Bentonite process.

The contractor first digs an open excavation 10 ft deep along the tunnel's right of way for its full width. To form the tunnel walls he digs two parallel trenches 27 ft deep and 3 ft wide with a rail mounted rig operating a clamshell bucket. Material is deposited into a hopper attached to the rig then discharged onto a conveyor that carries the material to rail-riding muck cars.

Bentonite mud then is pumped into the trench to stabilize the walls. Cages of reinforcing steel are lowered into the mud-filled trenches, and concrete is tremied to the trench bottom forcing the Bentonite up to the surface. Tremie concreting is handled by a second crane-like rig that rides tracks.

Metropolitana, a city-owned organization, plans and directs the subway project. Ferrobeton is a contractor group specially formed for the job. Total building cost will come to about $5 million. The project is expected to be completed sometime in 1960.

Look ahead
...*move ahead*
...and stay ahead
with Allis-Chalmers crawler tractors

first choice on more and more tough jobs

Four big advantages stand out in the coast-to-coast swing to Allis-Chalmers crawler tractors:

- **outstanding work capacity**
- **real dependability under severe conditions**
- **easy maintenance and lubrication**
- **timesaving, cost-cutting service**

As a result, Allis-Chalmers users bid closer to the belt, set schedules with more confidence, end up "in the black." So before you buy your next tractor, take a close look at *these* machines . . .

There's an extra measure of

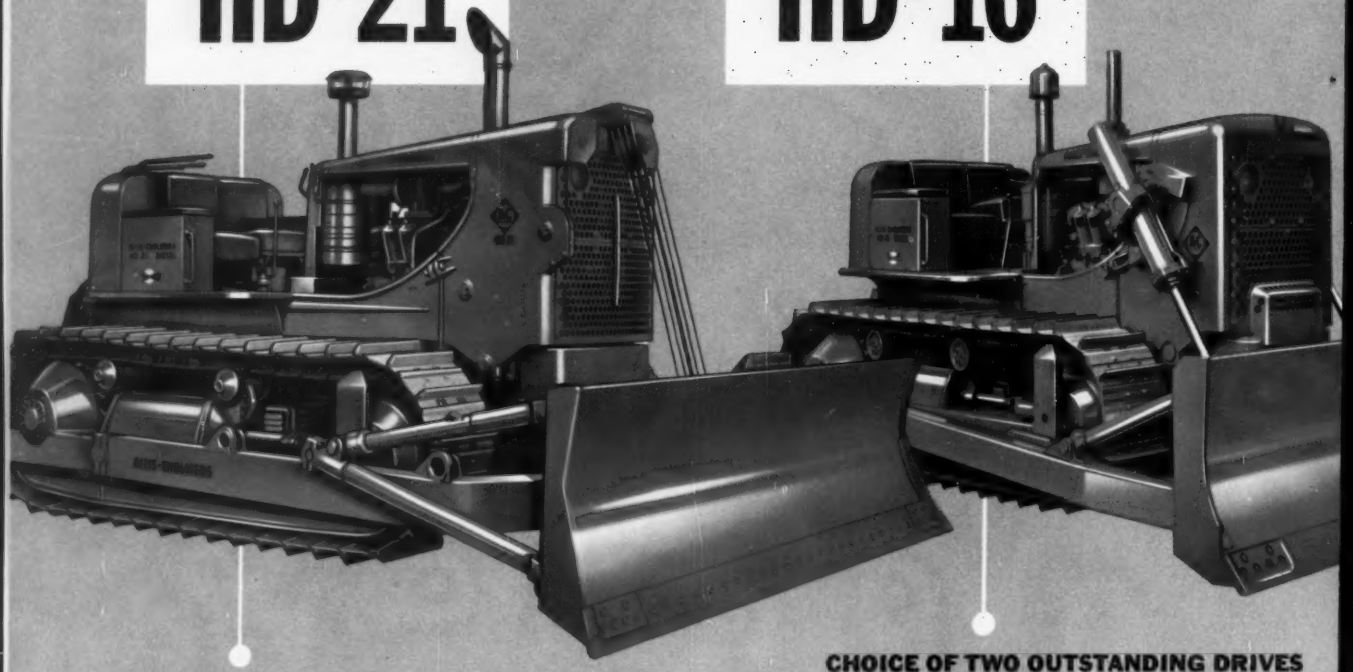
IN EVERY SIZE.

ALLIS-CHALMERS

HD-21

ALLIS-CHALMERS

HD-16



225-hp turbocharged engine
Hydraulic torque converter drive
56,260 lb (approx. as shown)

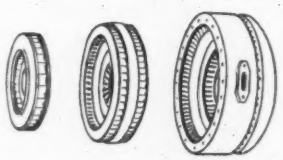
The new HD-21 brings you live power for today's big-tractor jobs—and torque converter drive puts it to work automatically. The HD-21 offers more work capacity—dollar for dollar—than any other big crawler tractor you can buy.
HD-21A illustrated—Two other models available

CHOICE OF TWO OUTSTANDING DRIVES

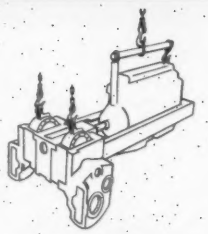
Hydraulic torque converter	All-gear
150 net engine hp	141 belt hp
39,090 lb (approx. as shown)	125 drawbar hp

Get up on the HD-16 yourself—and see how it handles jobs ordinarily assigned only to bigger, more expensive crawler tractors. You'll sell yourself—just as more keen-eyed construction men do every day.
HD-16DC illustrated—Five other models available

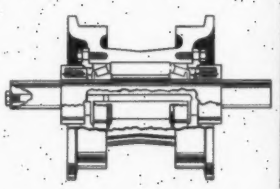
Pioneered and proved by Allis-Chalmers Engineering in Action



Torque Converter Drive gets more work done—automatically provides the right pull or push for every load, at maximum speed for existing conditions. *(Available in HD-21 and HD-16 only.)*



Unit Construction saves valuable time . . . lets you remove any major assembly without disturbing adjacent assemblies.



1,000-Hour Lubrication intervals for truck wheels, idlers, support rollers . . . changes daily greasing time into production time.

THE ONLY COMPLETE LINE OF CRAWLER TRACTORS THAT

performance and dependability

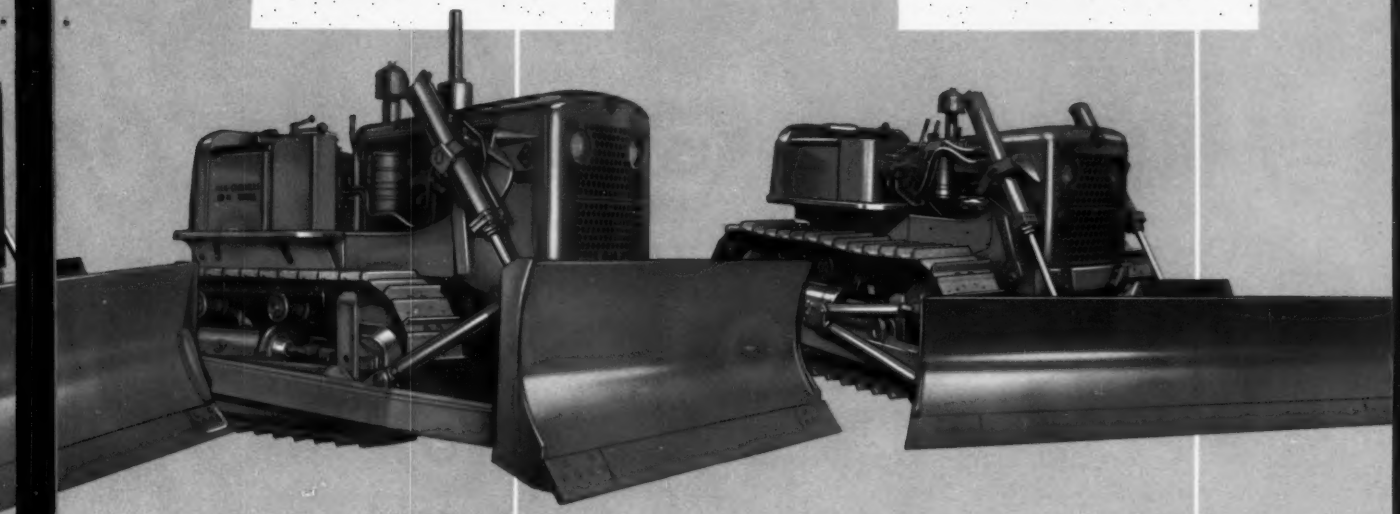
. . A SIZE FOR EVERY JOB

ALLIS-CHALMERS

HD-11

ALLIS-CHALMERS

HD-6



94 belt hp

25,960 lb (approx. as shown)

The HD-11 is setting new standards in its size range . . . offers you dozens of work-boosting advantages, including the industry's easiest shift pattern. A single shift takes it from any forward speed to any reverse—gets short-cycle jobs done faster, easier.

HD-11B illustrated—Two other models available

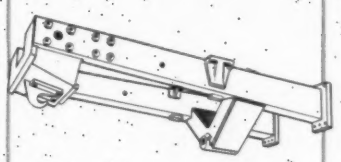
63 belt hp

16,470 lb (approx. as shown)

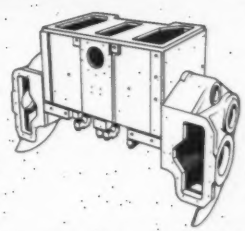
Here's up to 15,500 lb drawbar pull. The HD-6 is the only tractor near its size with big-tractor design advantages—for example, All-Steel Box-A main frame and engine-mounted dozer with direct-lift cylinders for improved weight distribution, accurate dozing and long life.

HD-6E illustrated—Three other models available

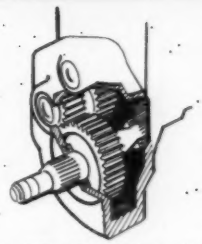
True-Dimension Track heat-treated and machined in the industry's most modern facilities, is setting new track-life records on every type of work.



All-Steel Box-A Main Frame soaks up shock and strain . . . provides improved weight distribution and equipment mounting.



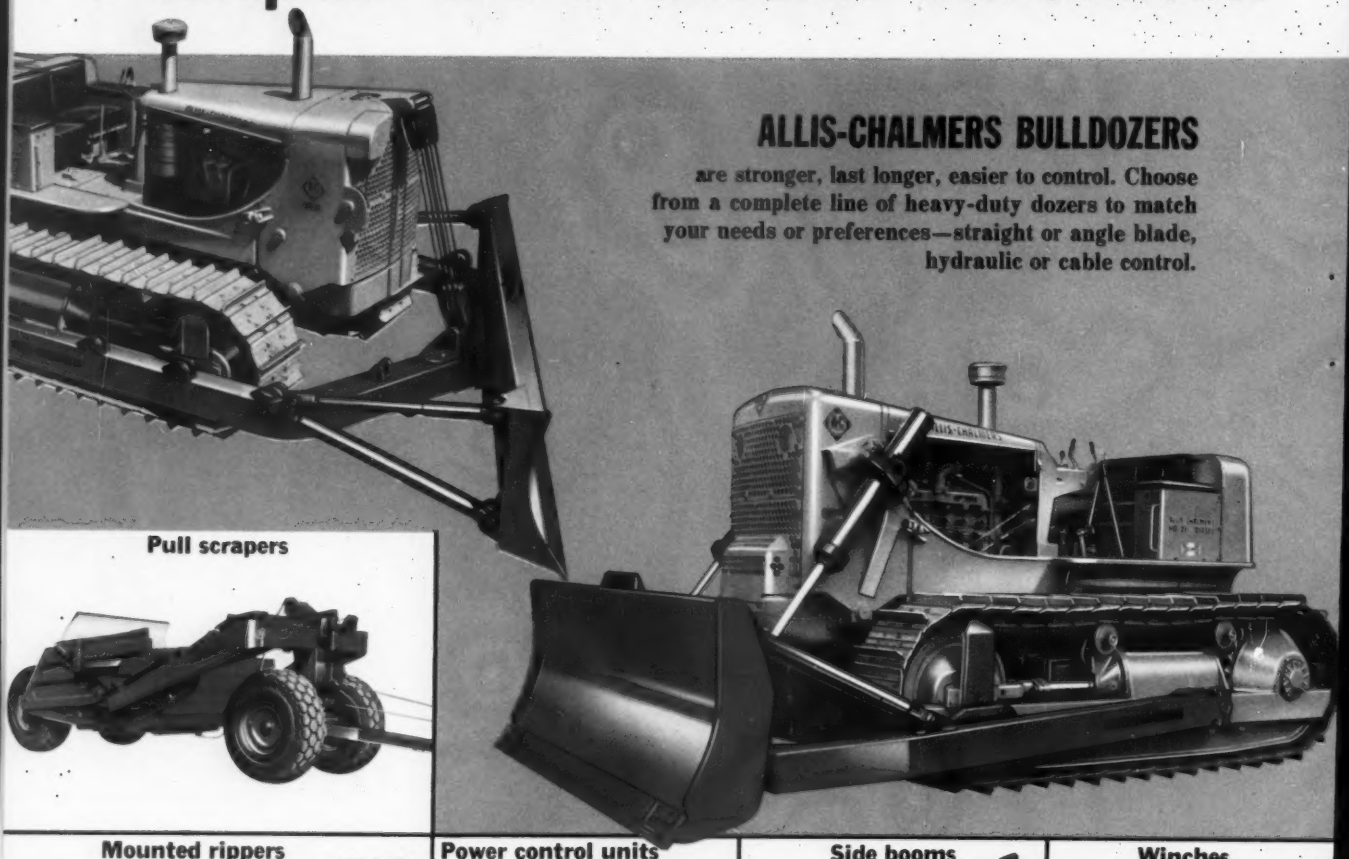
One-Piece Steering Clutch and Final Drive Housing with extreme rigidity and strength . . . line-bored to provide precise alignment of gears and shafts.



Straddle Mounting of All Final Drive Gears with tapered roller bearings on both sides of short, large-diameter shafts . . . provides extra gear life.

GIVES YOU ALL THESE ADVANTAGES IN EVERY SIZE . . PLUS

a complete line of matched attachments



ALLIS-CHALMERS BULLDOZERS

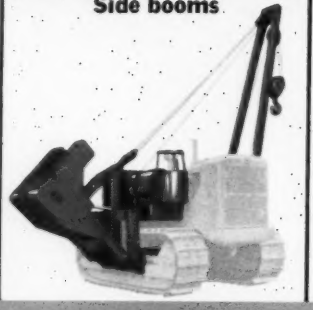
are stronger, last longer, easier to control. Choose from a complete line of heavy-duty dozers to match your needs or preferences—straight or angle blade, hydraulic or cable control.

Pull scrapers

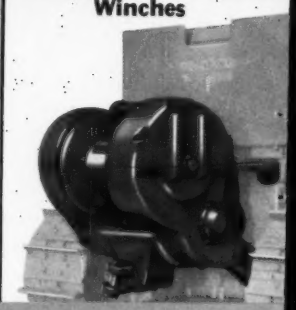
Mounted rippers

Power control units

Side booms



Winches



A demonstration on your job will prove their value . . . call your Allis-Chalmers dealer now.

Look ahead...*move ahead*...and stay ahead

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

FORM MS-1303

LITHO. IN U.S.A.

Construction Men in the News . . .

Dravo

ROBERT A. THOMPSON is the new assistant operations manager of Dravo Corp.'s Contracting Division.

A graduate of Rose Polytechnic Institute, Thompson joined Dravo in 1928. Prior to receiving his new position, Thompson served as a field superintendent. He most recently supervised all construction on the Taconite Harbor project on Lake Superior for Erie Mining Co.

National Constructors

RICHARD E. CHISLETT is the new secretary-treasurer of the National Constructors Association.

Chislett formerly served as chief of the Employer Relations Section of the International Labour Office in Geneva, Switzerland. Before that he was associated with Standard Oil Co. of New Jersey and the Newark, N. J., Chamber of Commerce.

National Constructors is an organization of leading engineering and building firms specializing in the design and construction of chemical plants, petroleum refineries, steel mills, and power plants.

Tishman

WALTER J. HARING, a construction superintendent for the Tishman Realty & Construction Co. of New York City, will replace Joseph H. Williams as manager of the firm's maintenance and mechanical division. Haring has been with Tishman for 27 years except for a brief tour of duty during World War II as a gunnery officer in the U.S. Navy.

Public Roads Commissioner

ELLIS L. ARMSTRONG of Salt Lake City will become Commissioner of the Bureau of Public Roads, Secretary of Commerce Sinclair Weeks has announced.

Armstrong, now director of highways for Utah, will take office in October as second in command to Federal Highway Administrator Bertram D. Tallamy.

Armstrong was a design and construction engineer with the Bureau of Reclamation from 1936 to 1953. In 1953 he was loaned to the Department of State for assignment to Egypt as a special consultant on the Aswan Dam. He later became project engineer on the St. Lawrence River power project. Some of the projects on which he worked either as supervisor or engineer include Trenton Dam in southwestern Nebraska, and Anderson Ranch Dam in southern Idaho.

Daniel Construction

CHARLES W. COX will head the newly opened New York City office of Daniel Construction Co., Greenville, S. C. Cox previously had been with American Viscose Corp. and the Chemstrand Corp. as a construction supervisor.

George A. Fuller

JAMES B. TAYLOR, JR., is a new vice president of the George A. Fuller Construction Co. He will work out of the New York office.

continued on page 150

HERE'S DEPENDABLE
WELLPOINT SERVICE
FOR YOUR
WET JOB

POWER HOUSE
PIPELINE
SEWAGE PLANT
SEWER
BUILDING
BRIDGE PIER
DAM
DRYDOCK
OR OTHER
CONSTRUCTION

ANALYSIS OF GROUND-WATER PROBLEM AND PRE-BID DEWATERING ESTIMATE WITHOUT OBLIGATION

GRIFFIN
WELLPOINT CORP.
SALES • RENTAL • CONTRACT

881 E. 141st St., New York 54, N.Y.
Jacksonville, Fla. • Houston, Tex.
W. Palm Bch., Fla. • Hammond, Ind.

In Canada: Construction Equipment Co., Ltd.
In Venezuela: Drew Bear & Sons C.A.

SIX LANES...NINE MILES

—AND EIGHTEEN MONTHS

The pressure is on for the builders and their Cities Service Lubricants

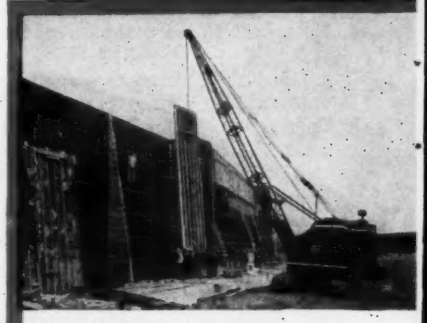
Working against the clock, two of the Midwest's most respected construction companies have joined hands in the building of a nine mile segment of the new Illinois Toll Road outside of Chicago.

The two firms, M. J. Boyle & Co., and Ryan Construction, are contractors for the entire job—excavations, grading, building and paving—and they have eighteen months to do the job. Before it is completed, they will have moved 5,000,000 yards of earth and constructed fourteen bridges in addition to the actual six lanes of road.

Clearly, the pressure is on! And sharing that pressure are Cities Service fuels, oils and greases. For when M. J. Boyle and Ryan Construction decided to team up, it was obvious they would need to standardize their fuels and lubricants—and the selection of Cities Service high quality products seemed the logical choice.

And logical it was! For despite an especially bad winter and a torrid summer, despite round-the-clock operation in heavy rain, snow, and mud, there's never been a lubrication failure of any kind.

At right, you can see some of the many Cities Service products used in this project—and the special advantages they offer. But only a Cities Service Lubrication Engineer can tell you how they might apply to *your* operation. Have a talk with him. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



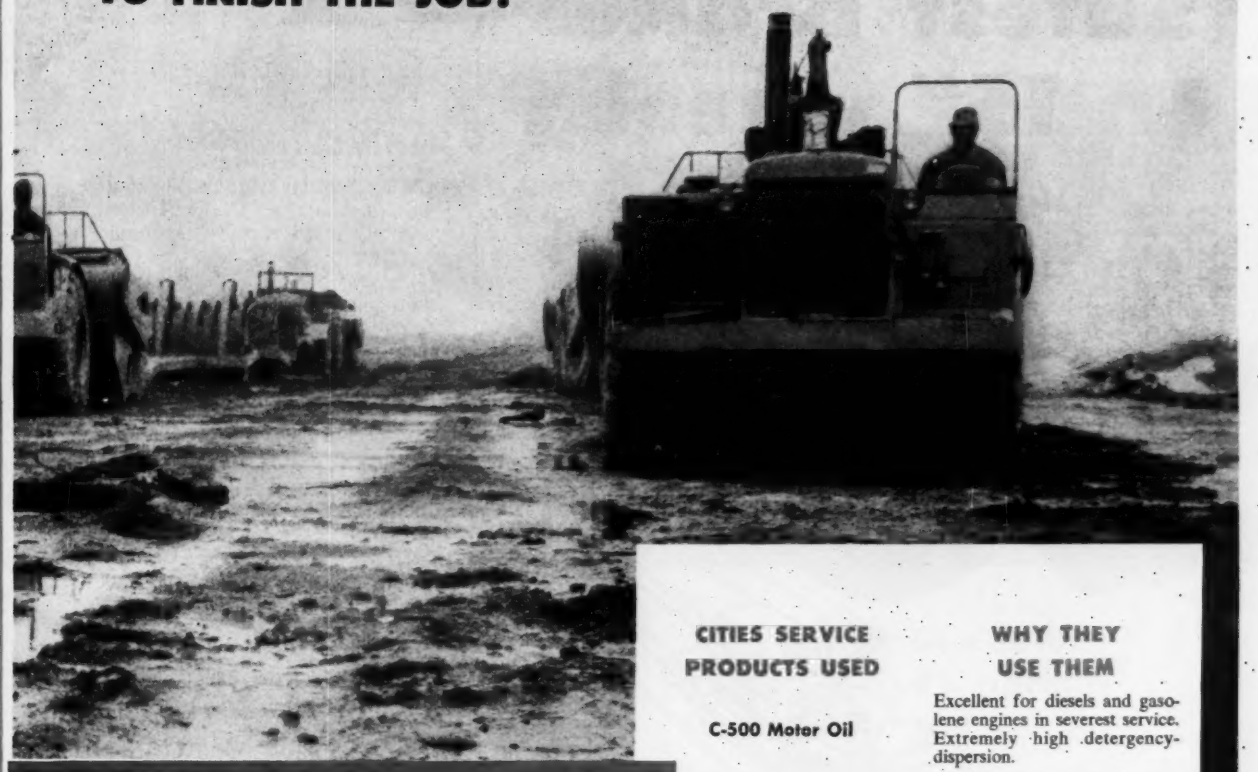
More than one bridge per mile, some of them major construction jobs, are included in the nine-mile segment being built by M. J. Boyle & Co. and Ryan Construction. To meet their 18-month schedule, the two firms have pressed 1200 men, countless machines and Cities Service lubricants into round-the-clock service.

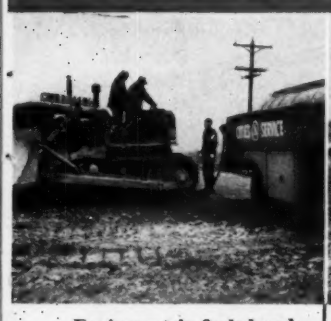
CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

...FOURTEEN BRIDGES

TO FINISH THE JOB!



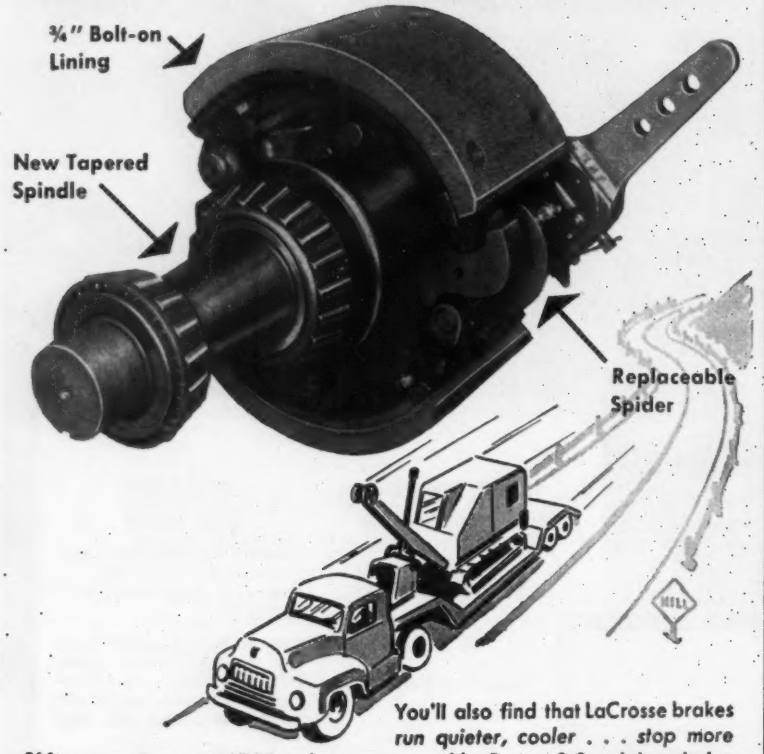


Equipment is fueled and serviced where it stands, by roving Cities Service truck. Field service assures maximum use of machinery and minimum downtime. Equipment stays on job where it must remain to keep tight schedule.

Tough Grind: Forging through heavy mud, these trucks illustrate the conditions prevailing during round-the-clock construction. Plenty of factors to cause lubrication failure—but there hasn't been a single one, thanks to Cities Service heavy duty oils and greases.

CITIES SERVICE PRODUCTS USED	WHY THEY USE THEM
C-500 Motor Oil	Excellent for diesels and gasolene engines in severest service. Extremely high detergency-dispersion.
Trojan H-2 Grease	New multi-purpose lubricant cuts inventory, reduces wear. Ideal for chassis, wheel bearings, water pump, etc. Better protection against mud and water.
Trojan Gear Oil	High-quality gear lubricant, blended from refined, high-viscosity index stocks. Contains oxidation inhibitor and anti-foam agent. Free-flowing, even at low temperatures.
DC-900 Oil	Ideal compressor lubricant. High viscosity index, superior anti-foam, anti-rust and anti-oxidation properties. Reduces deposit build-up.
Optimus 6 Steam Cylinder Oil	Unusually high-grade, filtered oil suited to pile drivers. One of many Cities Service steam cylinder oils.
Cities Service Diesel Fuel	Clean burning, for all diesel engines.
Milemaster Gasolene	A new regular gasolene of premium quality. Quick-starting, exceptionally clean burning.

BIGGEST
Safest Brakes on 15" wheels!



When you have to STOP a heavy trailer load barreling down a steep grade, that *EXTRA 52 sq. in. of braking surface* you get on a LaCrosse tandem axle trailer, can mean the difference between life and serious injury — to men and to the equipment being hauled!

Remember, every LaCrosse-engineered trailer brake measures 12¾" x 6" wide — ½" *wider than any competitive lining used with 15" tires.* This means 13 sq. in. more lining per wheel — 52 sq. in. of extra safe braking area on every LaCrosse 4-wheel trailer.

You'll also find that LaCrosse brakes *run quieter, cooler . . . stop more smoothly.* Reason? Special exclusive S-cam design, with worm-gear slack adjusters and direct chamber-to-axle mounting. Linings are tough ¾" bolt-on type, which *outlast ordinary lining 45%,* according to owner records. In addition, LaCrosse now gives you removable bolt-on brake spiders, for quick, economical field replacement as needed—another important advantage found only on LaCrosse.

For free literature describing ten other exclusive LaCrosse advantages, write: LaCrosse Trailer Corp., Gould St., LaCrosse, Wis.

LC-33

Heavy metal fabrication since 1865

LaCROSSE

. . . the low-bed backed by a 1-year warranty

MEN IN THE NEWS . . .
continued

Taylor joined the company in 1940 as a superintendent of construction on the Naval Air Base at Quonset Point, R. I., and the Argentia Naval Air Base in Newfoundland.

Austin Co.

EDMUND W. HOLLISTER is new assistant manager of the Austin Company's 14-state Cleveland District.

Hollister joined Austin as an equipment engineer in its New York district in 1940, and in 1943 was placed in charge of design of all mechanical installations at the $50-million Chicago Army Aircraft plant.

Corps of Engineers

LT. COL. FRANK A. GERIG, JR., is the new executive officer of the Delaware Valley Report Group making a comprehensive survey of the water resources of the Delaware River Basin.

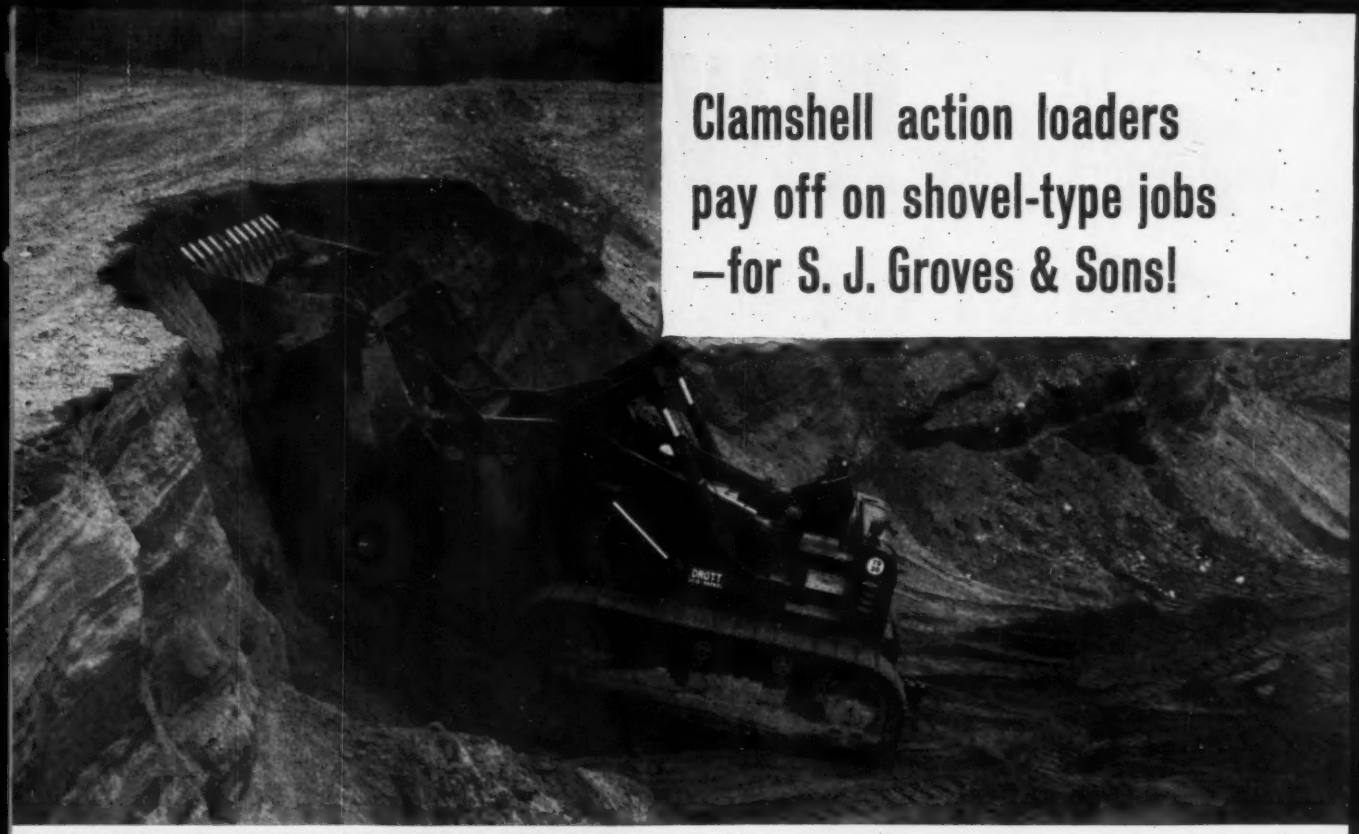
MAJ. CHARLES S. TOWNSHEND, JR., assistant to the district engineer for special projects, becomes Lt. Colonel.

MAJ. HOWARD W. DURHAM, SR., is the new assistant to the district engineer for civil works. His previous assignment was with the headquarters, Third Armored Division in Germany.

PHOTO CREDITS

Cover—Ontario Hydro; 72—British Combine; 72-73—Ontario Hydro; 74—Dominion Bridge Co. and Associated Commercial Photographers Ltd.; 75—Contractors Service Ltd.; 76—(top and center) U. S. Corps of Engineers, (bottom) Ontario Department of Highways; 81—Contractors Service Ltd.; 82—Contractors Service Ltd.; 86—(left) Dominion Bridge Co. and Associated Screen News Ltd.; (right) Dominion Bridge Co. and C. L. Botham; 87—(top) Dominion Bridge Co. and Jones & Morris, (bottom left) Contractors Service Ltd., (bottom right) Thos. Storey (Engineers) Ltd.; 88—Thos Storey (Engineers) Ltd.

Clamshell action loaders pay off on shovel-type jobs —for S. J. Groves & Sons!



This Groves TD-20 4-In-1 (below) beats dragline excavating-loading production—on airfield construction near Burlington, Wisconsin! The nimble, fast-swinging 4-In-1 delivers a big daily yardage into bottom dumps—gives crawler mobility, 109-inch track stability, and quick TD-20 forward-reverse "Shuttle-Bar" travel speed! The TD-20 4-In-1 shown is filling its bucket with speedy, load-in-place clamshell action.

3-yd multiple-action TD-20 4-In-1's handle BIG job range!

"Back-dragging" with exclusive 4-In-1 clamshell action (above) pulls down highwall—mixes stratified layers—replaces big-capacity, power shovel performance on S. J. Groves & Sons New Jersey highway job. Further mixing by clamshell bottom dumping (at left) produces select fill material. In addition, this TD-20 4-In-1 loads out excess materials all over the project, including stumps and boulders — provides earth-rolling bulldozer action for haul road maintenance, wherever needed! Another Groves 3-yd International Drott 4-In-1 loads out fill on this project!

See what it means to multiply your job range and divide your machine investment by four — with an International Drott 4-In-1! Measure exclusive 4-In-1 advantages like pry-over-shoe break-out action, and shock-swallowing Hydro-Spring. Move the "machine-selector" lever—watch how a 4-In-1 can instantly replace one costly limited-duty machine after another, on job after job. See your International Drott Distributor for a demonstration of versatility unlimited!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

Contractors report

NEW TD-20's are *with new power...*

In Washington, D. C., a pair of International Drott TD-20 Skid-Shovels operate double-shift—on the Shannon Construction Company ½-million cu. yd. excavating sub-contract for the new House of Representatives office building. Much of the time, the TD-20's are digging and loading gummy clay. "In my opinion," states Contractor W. D. Shannon, "the TD-20 Skid-Shovel is the only loader with the clearance, pry-out action, and fast operating travel and lift to do this job successfully. The TD-20 'Shuttle-Bar' has speeded up the operation, and so has its ease of handling."

increasing production up to 50%

new speeds...*"Shuttle-Bar" control!*

Modernizing a 10½-mile stretch of Louisiana 313, Contractor M. T. Bradley, Kentwood, Louisiana, makes use of new TD-20 speed and capacity—to clear right-of-way; doze heaping blades of water-logged soil to hurry drying; and as a pusher. "The TD-20 will load a 15-yd. rubber-tired hauler, in 75 ft. and in 25 seconds (average)," reports Mr. Bradley.

It's the combination of 134 hp, six forward and reverse speeds with "single-stick" shift, and rapid "Shuttle-Bar" direction-changing—that account for amazing work capacity in the new TD-20! You've got an instantly available forward and reverse speed range for every load, condition, and operating situation.

On dozing, push-loading, powering front-end loader—wherever owners take advantage of the new TD-20's greater hp and the new speed of applying it—they're setting new performance records for crawlers of this size range!

In certain instances, the new TD-20 is increasing material-moving production as much as 50%—compared to competitive crawlers!

See how TD-20 shifting and "Shuttle-Bar" direction-changing with just a sweep of the hand speed dozing and loading cycles. Measure how new TD-20 handling ease and response can boost your daily yardage and operator efficiency. See your International Construction Equipment Distributor for a demonstration!

This new International TD-20 powering the Bullgrader blade full of "dead" sandy soil clears land, roughs out right-of-way, and acts as pusher for a fleet of rubber-tired haulers. It's working on the F. C. Herling road-building job, near Franklin, Texas. "We like the TD-20 very much because it is fast, and will put 18 yards of dry, sandy dirt on a scraper in only 40 seconds," states Job Superintendent Bricker!

"The TD-20 can doze up to 50% more material per load than the comparable-sized crawler it replaces—and it's faster both in forward and reverse," states Walter Folger, president, C&F General Contracting Co., Inc., Shamokin, Pa. "The TD-20 has been the most effective tractor we have used." And the TD-20's operator adds: "The forward-reverse 'Shuttle-Bar' boosts our yardage, and doesn't work me so hard."

International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

AFTER LOAD-FOR-LOAD COMPARISONS,

contractor trebles Payhauler® fleet!

Producing 380,000 cu. yd. of aggregate for their bypass paving contract (Rt. 277 around Abilene, Texas) Cage Brothers keep six units of their 9-Payhauler fleet busy at this quarry. With three units feeding crusher, and three stockpiling, the plant produces 7,000 cu. yd. of minus 2-in. aggregate daily.

Ton-for-ton and yard-for-yard, the road-building Cage Brothers, San Antonio, Texas, compared International Payhauler production with competitive off-highway rigs. Result: They trebled their "65" Payhauler fleet within a year!

Let Superintendent E. A. Rice give you the details:

"First we bought three Payhaulers and three competitive haulers. When we found it took two of them to equal one Payhauler, we got three more Internationals. Now (with more hauling) we have added another three, to give us nine Payhaulers.

"We've never had better equipment. Payhauler power, speed, and fast dumping cut cycle time. Operators go for Payhauler operating ease and riding comfort."

International Payhauler models give you fast getaway with a bonus of turbo-charged diesel power. They have a gear choice to match every load and road. And they provide the power-cushioning leverage of full-floating planetary drive axles, to minimize the slam-bang shock of off-road full-load hauling!

Try Payhauler "pick-up truck" spotting ease—assured by "zip-around" power steering and exclusive high reverse. Prove full-load ramp-climbing "muscle"—and up to 25% faster haul speeds. See how 7½-second dumping and Payhauler operating ease and safety figure sharply in out-hauling other makes, up to 2-to-1! See your International Construction Equipment Distributor for a demonstration.

With extra-large air brakes, air-assisted clutch, and integral hydraulic steering, the "65" Payhauler gives fingertip operating ease—even when hauling 18-ton loads over rough terrain. This pair is stockpiling aggregate for Cage Brothers.

International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Baldwin-Lima-Hamilton Corp.: The Madsen Works has appointed these two distributors: Interstate Equipment Co., of Statesville, N. C.; and S. M. Christhilf & Son, Inc. of Timonium, Md. The Construction Equipment Division has named the following six distributors: Contractors Machinery Co. of Detroit, Mich.; Ogden Equipment Co. of Jacksonville, Fla.; Korte Bros., Inc. of Fort Wayne, Ind.; Fred Malotte Machinery Co., Inc. of Petersburg, Ind.; Machinery and Supplies Co. of Kansas City, Mo.; and Malotte Machinery Co. of Indianapolis, Ind.

Worthington Corp.: The J. C. Lembo Machine Corp. of Corona, N. Y., has been appointed sales and rental distributor of Worthington construction equipment.

U. S. Rubber Co.: All industrial supply outlets of the Garrett Corporation have become distributors for U. S. Rubber products. Champion, Inc., of Iron Mountain, Mich., also becomes a distributor of U. S. Rubber industrial products.

Harnischfeger Corp.: Drott Tractor, Inc., with facilities in Milwaukee, Madison, and Rice Lake, Wis., and Iron River, Mich., has been named distributor for the full line of P&H power cranes and shovels. The P&H Diesel Engine Division has appointed Calavar Corp. of Los Angeles, Calif., as distributor.

General Motors Corp.: Euclid Division has appointed Brooks Machinery, Inc., of Marietta, Ga., Pace-Euclid, Inc. of Kansas City, Kan., and Northern California Euclid, Inc. of Sacramento, Calif., as distributors.

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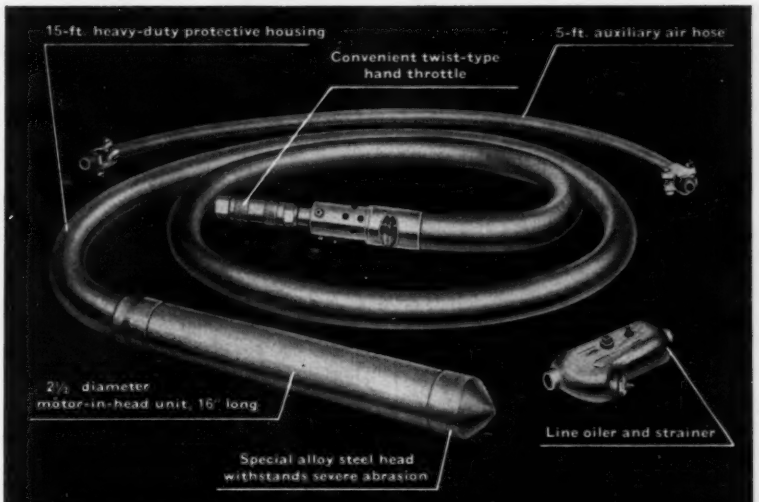
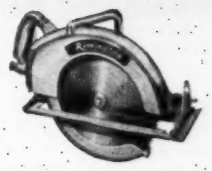
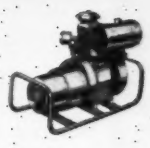
POWER to boost job efficiency with REMINGTON tools


15-ft. heavy-duty protective housing
Convenient twist-type hand throttle
5-ft. auxiliary air hose
2½ diameter motor-in-head unit, 16" long
Special alloy steel head withstands severe abrasion
Line oiler and strainer

Concrete Vibrator, Model PV24—Air-powered, one-man, motor-in-head unit. Low air consumption—operates from your compressor. Heavy-duty roller- and ball-bearing construction; 11,000 rpm at 90 psi. Price $305.00*



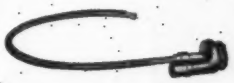
Air circular saw, Model P128—12" blade. Husky 2½-hp motor safe from shock hazard around wet piers and wharfs. With case, blade and hose. **Price $345.00***



Generator Set, Model 3WAS—3,000 watts capacity, 25 amp. AC at 115 v.; 60-cycle; four take-off plugs. Reliable Wisconsin 8-hp engine. **Price $525.00***

Planer, Model 3P—Knob depth adjustment can be changed while cutting. Fast, easy to operate; 8.4-amp, 115-v., AC/DC motor; weight: 15 lbs. **Price $170.00***

Remington delivers power, mobility and easy handling to help you cut man hours on the tough jobs. Remington Power Tools are designed and built for long service with minimum maintenance. Your Remington distributor stocks and services the industry's widest selection of power tools and parts.



Sump Pump Attachment, Model 45860—Readily attached to work off Remington flexible shaft vibrators; big capacity, 2" discharge. **Price $90.00***

Electric Drill, Model 540—1¼" capacity; extra-heavy-duty, 18 amp., 115 or 230-v. motor; Timken roller bearings; No. 3 Morse taper spindle. **Price $220.00***

CHOOSE THE POWER MOST EFFICIENT FOR YOU. REMINGTON POWER TOOLS ARE AVAILABLE IN **AIR · ELECTRIC · GASOLINE-DRIVEN MODELS**

Remington

Remington Arms Company, Inc., Bridgeport 2, Conn.
In Canada: Mall Tool, Ltd., 36 Queen Elizabeth Blvd., Toronto, Ont.

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Send for illustrated catalog showing complete line of Remington Contractor and Industrial Tools with specifications and performance data. Mail the coupon—there's no obligation.

Specifications and prices subject to change without notice.

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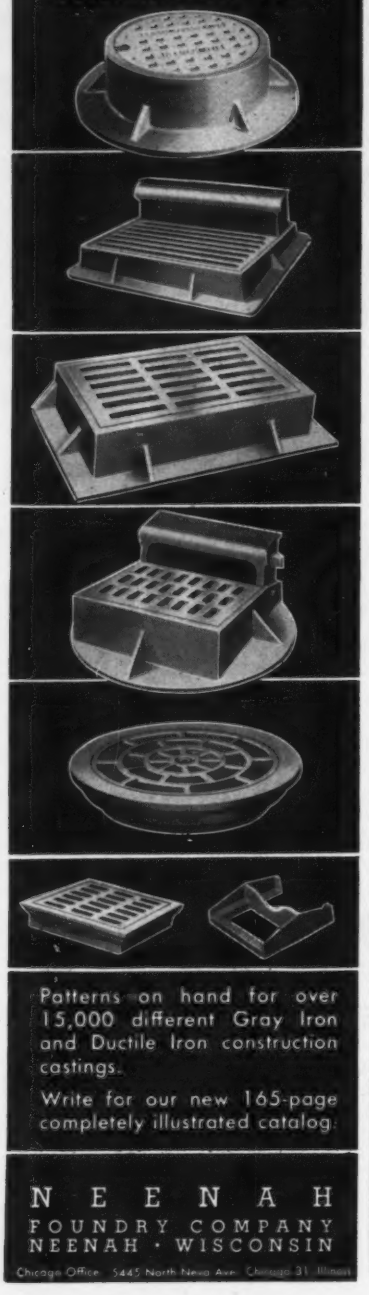
★ SUPERIOR FINISH
★ SOLID VALUE
DELIVERED ON TIME



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SALES AND SERVICE . . .
continued

Chrysler Corp.: The Marine and Industrial Division has appointed the following three dealers: Martin Motor Co. of Springfield, Mo.; Godwin and Singer of St. Petersburg, Fla.; and Industrial Engine Service Co. of Youngstown, Ohio.

The Prime-Mover Co.: The following three distributors have been named: E. L. Lester & Co. of Houston, Tex.; Girard Machinery & Supply Co. of San Antonio, Tex.; and King & East Machinery Corp. of Denver, Colo.

On the Sales Front

John A. Roebling's Sons Corp.: Charles A. Wagner has been named Philadelphia district manager for the Wire Rope Division. The Construction Materials Division has named Richard H. Driscoll sales representative.

Buck Equipment Corp.: Ralph J. Chrobak has been named vice president in charge of sales. He will make his headquarters in Cincinnati.

Boston Woven Hose & Rubber Co.: Three new district managers have been named. They are: Thomas M. Kirchner, Los Angeles district; George J. Talbot, Jr., New Orleans district; and Charles L. Dubbs, Baltimore district.

Iowa Manufacturing Co.: Leonard Dvorak is now district sales representative in Portland, Ore., covering California, Nevada, Oregon, and Western Washington. Leo A. Thomsen becomes sales representative for western Canada.

Owatonna Tool Co.: The company announces a reorganization of its sales department. John Mullenmaster becomes vice president and director of sales. Two territorial sales divisions have been formed; Robert Allyn heads the eastern division and William Murray, the western division.

Allis-Chalmers Mfg. Co.: The company is expanding its utility tractor business with the appointment of J. D. Morris as sales manager of the new Utility Tractor and Equipment Sales Department. M. J. Rotroff has been appointed Manager, General Sales for New York City.

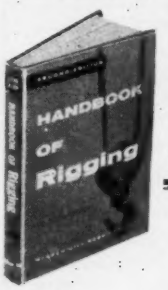
continued on page 158

ESTIMATING CONSTRUCTION COSTS

2nd Ed. Just Published—Brings you simpler ways of appraising the many factors that influence the direct costs of labor, equipment, and materials—*plus* the indirect costs of insurance, taxes, bonds, supervision, overhead, and profit. Over 200 time-saving tables break down operations into workable units such as the amount of material needed for a certain job . . . the man-hours it takes . . . the hourly cost of owning and operating the equipment, etc. Helps you select rates for practically any project under all types of conditions. By R. L. Peurifoy, Prof. of Construction Engineering, A&M College of Texas. 2nd Ed., 446 pp., 83 illus., 220 tables, $10.75.

BUILDING CONSTRUCTION HANDBOOK

Just Published—Here at last is that one volume you need to see you through any project connected with building design and construction. Every decision you have to make . . . every choice that you must weigh . . . can be handled with economy and dispatch when you have this master-handbook at your side. Supplies data on all specialized phases of constructing a building whether it's a private home or public auditorium . . . a factory or a school . . . an apartment house or an office building. Prepared by a Staff of Specialists, Frederick S. Merritt, Ed.-in-Chief. 851 pp., 428 illus., 183 tables, $15.00



HANDBOOK OF RIGGING

A thorough, practical manual of rigging practices and pointers for construction and industrial work. Shows you how to handle every step in a rigging operation—from rigging a swinging scaffold and painting a steel stack, to operating a hoist or using a hydraulic jack. Includes simple formulas used in calculating the strength of hoisting tackle, beams, and posts, etc.; information on the loading of heavy equipment for transportation, special scaffolds, safety belts, handling loads on slings, and much more. By W. E. Rossnagel, Safety Engineer. 2nd Ed., 342 pp., 323 illus., $6.50.

HOW TO BECOME A PROFESSIONAL ENGINEER

Shows how to get your professional engineer's license more easily — how to apply, how to take oral and written exams, how to write experience record, etc. Explains state laws, how examiners evaluate experience, examination room procedure, and other practical aids. Applicable in all states. By John D. Constance. 262 pp., $5.50.

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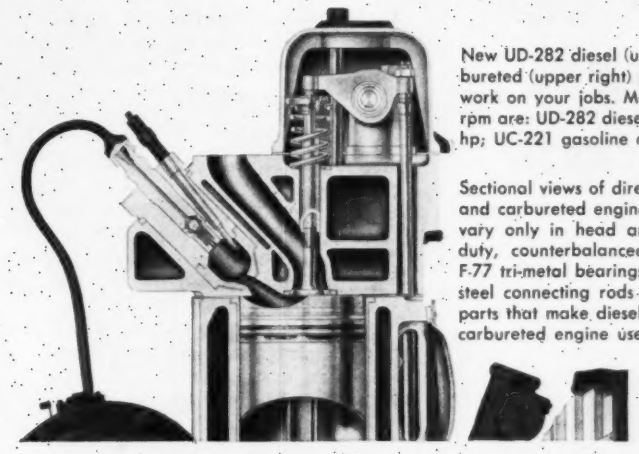
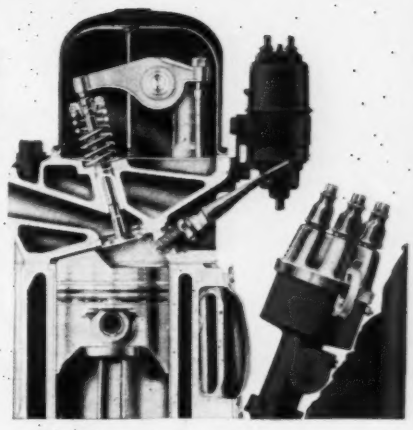


New UD-282 diesel (upper left) and UC-221 carbureted (upper right) power units ready to go to work on your jobs. Max. hp of engines at 2400 rpm are: UD-282 diesel and UC-263 gasoline, 90 hp; UC-221 gasoline and UD-236 diesel, 75 hp.

Sectional views of direct-start diesel engine (left) and carbureted engine (right) show how models vary only in head and piston sections. Heavy duty, counterbalanced alloy steel crankshafts, F-77 tri-metal bearings and heat treated forged steel connecting rods are some of the common parts that make diesel ruggedness available for carbureted engine users.



FOUR NEW 75-90 hp International 6's Offer Lower Cost Heavy Duty Power

Now you can power your machines with the same four new heavy duty 6-cyl. 75-90 hp engines used in the rugged top of the line International wheel tractors being announced this month. Each new pair of smooth-running diesel and carbureted engines is interchangeable in power and dimensions. And because all four are specifically built for heavy-duty work, many parts are common.

The 90-hp pair, the new UD-282 and UC-263, as well as the 75-hp UD-236 and UC-221, feature: 1) efficient, economical valve-in-head design; 2) replaceable cylinder sleeves; 3) thru-hardened counterbalanced crankshafts; and 4) gear-driven induction-hardened camshafts for a new high in long life dependability.

The UD-282 and UD-236 are direct start diesels with time-proven International pre-combustion chamber design. Use of a ¼" larger bore in the diesels makes possible the same power as corresponding carbureted models with lower B.M.E.P. A glow plug for each precup is regular equipment for easy starting in any weather. Mechanical governors on all engines provide excellent speed regulation.

Installation is simplified by 6-cylinder built-in smoothness, wide operating speed range, compact design, and availability of matched power unit components including air cleaner, base, radiator, and enclosure.

Get the complete feature story from your International Power Unit Distributor or Dealer. Then you'll know how much these new engines can save you powering your new machines or repowering your old equipment.

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

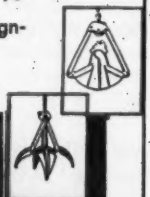
BIGGER PAY LOADS

with aluminum OWEN buckets

The combination of alloy aluminum plate with steel in the bowl construction of material handling buckets . . . 2½ cubic yards and over, eliminates up to 1000 pounds of dead weight. This affords a like amount of increase in pay load when rehandling comparatively light, free-flowing materials.

The exclusive feature of the closing line lead in the center plane of the bucket eliminates sharp bends at the guide sheaves and rollers, thereby increasing the life of the closing cable from 75% to 100%.

Long, internal main-shaft bearings insure permanent jaw alignment with minimum wear. Write for further details.



The OWEN BUCKET Co.

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Berkeley, Calif. • Fort Lauderdale, Fla.

SALES AND SERVICE...
continued

In the Main Office

Joy Mfg. Co.: George E. Clark, president of the Adams Express Co. has been elected chairman of the executive committee. Louis G. Helmick becomes executive vice president to succeed A. B. Drastrup who has resigned.

E. Boydell & Co. Ltd.: J. L. Sturrock has been appointed to the board of directors of the company. He had been sales manager for the past 6 yrs. Boydell is an English company manufacturing loaders, dumpers, and shunters.

Felker Diamond Drills, Inc.: Lester F. Kuzmick has been appointed general manager of the company.

Associations

Asphalt Institute: Three new appointments are announced. Paul S. Wright, a 34-yr veteran of the Los Angeles Department of Public Works, becomes commercial paving engineer for the Pacific Coast Division. Allison D. Hill, after 26 yr with the Kansas Highway Commission, becomes district engineer for Illinois. Earl G. Angell becomes district engineer for Minnesota and Iowa.

Building Research Institute: Charles H. Topping, senior architectural and civil consultant for E. I. duPont de Nemours & Co. was re-elected president of the Institute. Harold L. Humes, vice president of Baldwin-Hill Co. will serve a second term as vice president of the institute.

Special Mention

Gates & Sons, Inc.: The company has formed two subsidiary corporations. Gates & Sons of New York, Inc. in Rochester, N. Y., will start as a service branch and eventually become a full production unit. Gates & Sons of Washington, Inc., of Spokane, formerly United Distributors, Inc., is already manufacturing Gates products.

Cummins Engine Co.: The company will start this year on a $6 million, 300,000 sq ft addition to its manufacturing plant. This brings capital expenditures for 1958 to more than $12 million.

You find Gates Hose where anything flows
Mackinac Bridge, world's longest suspension bridge, connects upper and lower peninsulas of Michigan. Because reliability of equipment is an important factor in the grouting operations, Gates Water and Air Hoses were used.
PHOTOS COURTESY MACKINAC BRIDGE AUTHORITY
18 HB

Gates Air Hose helps build bridge "that couldn't be built"

TPA 304

Industry everywhere depends upon Gates Industrial Hose to provide air, water, steam, oil and suction for every type of application, including some of the toughest jobs in the world.

Actually there are *tens of thousands of miles* of Gates Hose in daily use — every type and size from air hose the diameter of a pencil to petroleum hose as big as the mains in city streets.

Back of the world-wide acceptance of Gates Hose is a continuing program of *specialized* hose research at the multi-million dollar Gates Research Center staffed by more than 200 chemists, physicists, engineers and technicians.

It is the aim of this *specialized* research to increase hose utility and life, and to lower industry's annual hose costs.

Because Gates Hose is so widely preferred, it is quickly available from leading distributors in all industrial centers in the United States and in 90 countries throughout the world . . . and its outstanding performance is guaranteed by the *World's Largest Maker of V-Belts.*

Gates 18HB Air Hose, with oil resistant tube and abrasion resistant cover, gives exceptional performance on all heavy duty air usage. This popular hose — one of many in Gates full line — is always available from your nearby Gates Distributor.

The Mark of Specialized Research

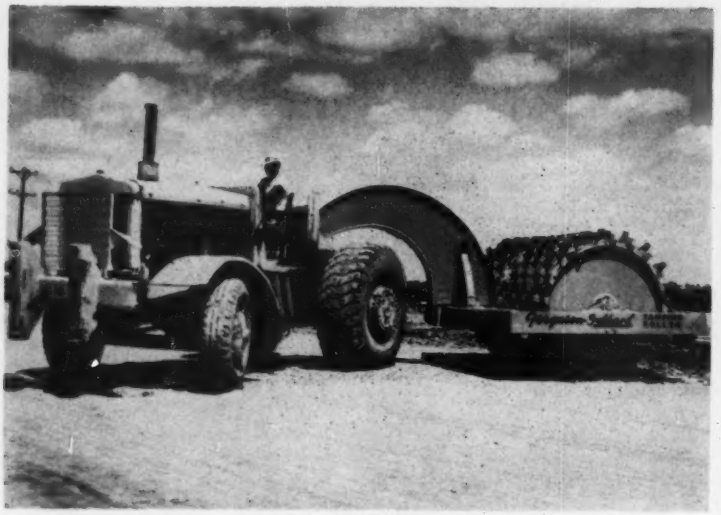
Gates

The Gates Rubber Company • Denver, Colorado

Gates Industrial Hose

Made in a Full Range of Types and Sizes

Construction Equipment News . . .



Gooseneck Tongue Lets Dual Drums Oscillate

The two-drum Ferguson-Gebhard tamper has been fitted with a gooseneck tongue that allows each drum to oscillate independently. The roller attaches easily to any of the big two or four-wheel rubber-tired tractors. To provide complete oscillation of both drums, the gooseneck tongue revolves freely around the roller's center pin. It is held upright by two cantilever springs and heavy bumpers limit side movement. The roller is available in several sizes with pressures up to 1,000 psi and 4,000 lb per ft of drum length. Two-wheel-tractor models turn in 20 ft.—**Shovel Supply Co., Box 1369, Dallas 21, Texas.**

Moldboard Extension Works Hydraulically

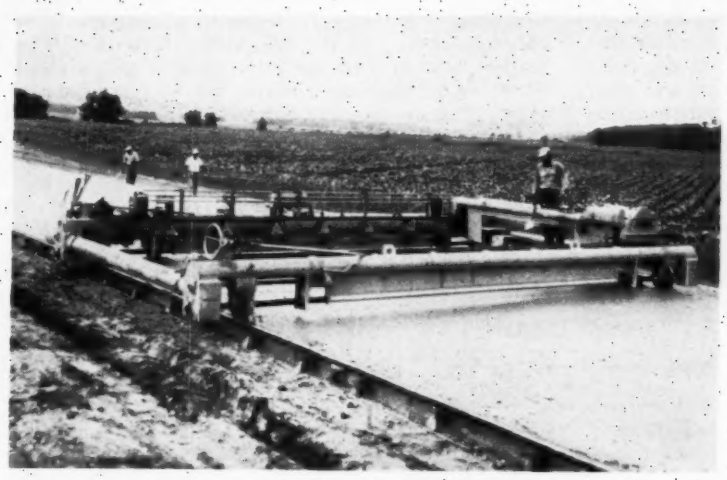
The Bee-Line Finisher acts as an adjustable extension to a motor grader moldboard. A light touch of the hydraulic control from the operator's platform moves the blade extension to the exact cutting angle desired. Positive hydraulic power keeps it in place—from 45 deg up to 45 deg down. The attachment strikes shoulder lines, makes wide cuts, and cleans material from the base of either back or fore slopes. Shown mounted on a Cat No. 12 grader, it is also available for Adams graders. — **Hasselbalch & Sons, 1112 Capital St., Omaha, Neb.**

Lorry Crane Offers Choice of Mountings

Insley's new WT lorry crane offers a choice of three truck mountings to meet varying axle load requirements. The 9-ft wide truck carrier gives the crane a capacity of 30 tons. A 25-ton carrier is available in either 8 or 9-ft widths. Rigged with the basic 35-ft crane boom and mounted on the 30-ton, 9-ft wide carrier the unit weighs 74,270 lb. Standard features include independent boom hoist; anti-friction bearings on high speed alloy steel shafts; and mechanical controls with booster-actuated drum clutches. —**Insley Mfg. Corp., Box 167, Indianapolis 6, Ind.**

Hydraulics Control Versatile Excavator

The hydraulically controlled B-4 Davis Hydraxcavator can be used as a crane, backhoe, shovel, or clamshell. Mounted on a 15-ft long, 7 1/3-ft wide chassis powered by a 64-hp gasoline engine, the Hydraxcavator features 360-deg continuous swing, left or right. A 30-gpm hydraulic pump delivers up to 1,500 psi. Standard tires are 7.50-20, 8-ply, with duals in the rear. Capacity is ⅜ yd with a 24-in. backhoe bucket or a 27-in. clamshell that connects directly to the boom. Shovel capacity is ½ yd. As a backhoe, the B-4 sells for $8,996, fob, factory.—**Davis Engineering, Inc., Dowagiac, Mich.**



Chain Belt Finisher Has Tubular Frame

Basic frame members of Chain Belt's Rex longitudinal float finisher are made from tubular steel to provide strength when working on wide slabs. Finishing is accomplished by a carriage that travels transversely between the tubular frames. A power unit on the floating carriage allows independent control of carriage and traction speed. Carriage direction is reversed at the end of each cycle automatically. The finisher is available with 10 to 15-ft and 20 to 25-ft width adjustments.—**Chain Belt Co., 4701 W. Greenfield Ave., Milwaukee 14, Wisc.**

Insulated Boom Guard Protects Operators

The Saf-T-Boom is an insulated guard that protects operators and others working near a crane boom that might accidentally touch a high tension line. The device consists of a 1¾-in. tubular frame that is connected to a boom through four insulators that will absorb up to 30,000 v. Available in two sizes—one for 20-ton and smaller cranes, the other for larger machines—Safety-Booms can be installed in 30 min. After initial installation, they are attached or removed in 10 min. —**Saf-T-Boom, Inc., 422 Pyramid Bldg., Little Rock, Ark.**

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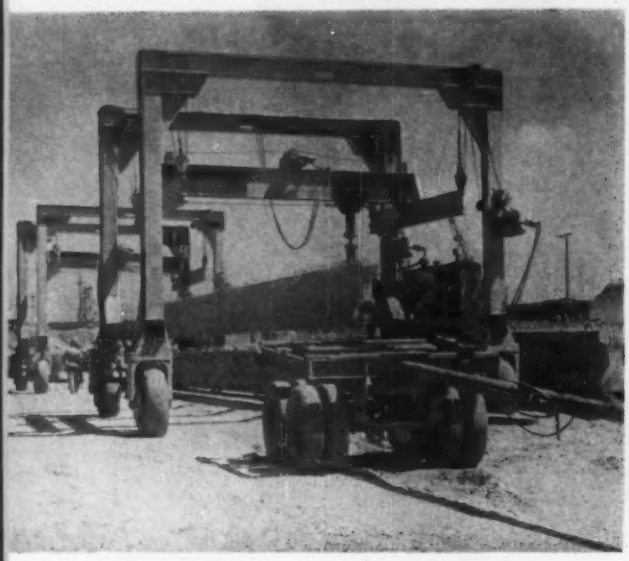
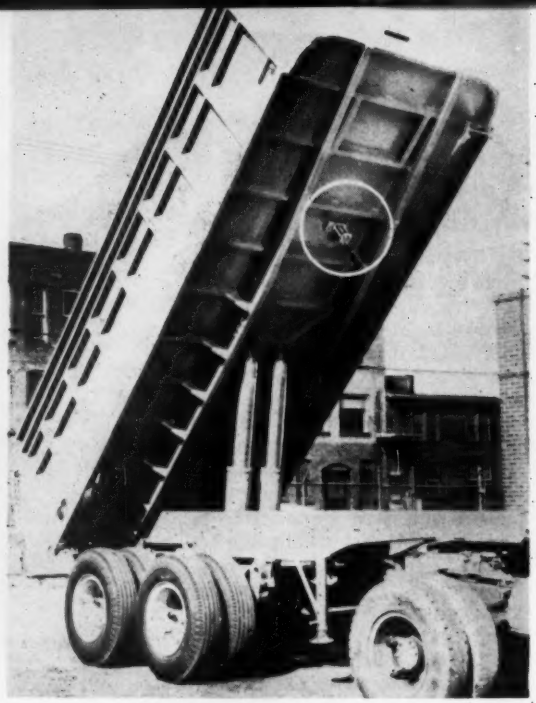


Speeds Prestressed Concrete Jobs

Lifting, traveling, and steering are done hydraulically on the Travelift, an all-purpose machine designed for handling prestressed girders. It also pulls strand, sets caging, handles and sets forms, and even pours forms. The Travelift can strip forms up to 60 ft long from both sides of a bed and reset them on other beds in a single operation. They are available in 7, 12, and 25-ton models.—**Travelift & Engineering, Inc., Sturgeon Bay, Wisc.**

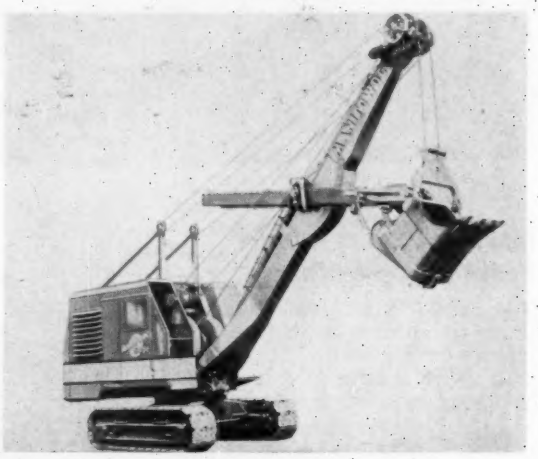


Vibrator Unloads Trucks Fast

Cleveland Vibrator's unit mounts on dump trucks to speed unloading of wet and sticky materials. The trailer pictured uses one 2-in. vibrator at the front of the body. Another vibrator can be placed at the rear. Cleveland's vibratory unit is a simple pneumatic cylinder and piston that takes air from the brake system. A reservoir fits into the air brake line to produce extra pressure.—**Cleveland Vibrator Co., 2703 Clinton Ave., Cleveland 13, Ohio.**

Skooper Combines Loader, Shovel

Koehring's new Skooper combines the best characteristics of a loader and shovel. With 360-deg turntable swing and 7-ft independent crowding action, the machine digs and loads while standing in one place. In tests, the machine loaded up to 400 tph. Buckets range from 1⅞ to 2½ yd. Maximum cutting height is 17 ft, 4⅝-in. and dumping clearance is 9 2/3 ft. The Skooper is powered by a 70-hp diesel engine.—**Koehring Co., Milwaukee 16, Wisc.**



Excavator Has Big Machine Features

Manitowoc's new model 2300 is easily rigged as a 1½-yd shovel, clamshell, or trench hoe; 1½ to 2½-yd dragline; or 35-ton crane. A feature of the machine is a hydraulic jack adjustment system that keeps tension on the crawlers. Other big machine features include an over-sized king pin; 62-in. roller path; and a centralized lubrication system.—**Manitowoc Engineering Corp., Manitowoc, Wisc.**

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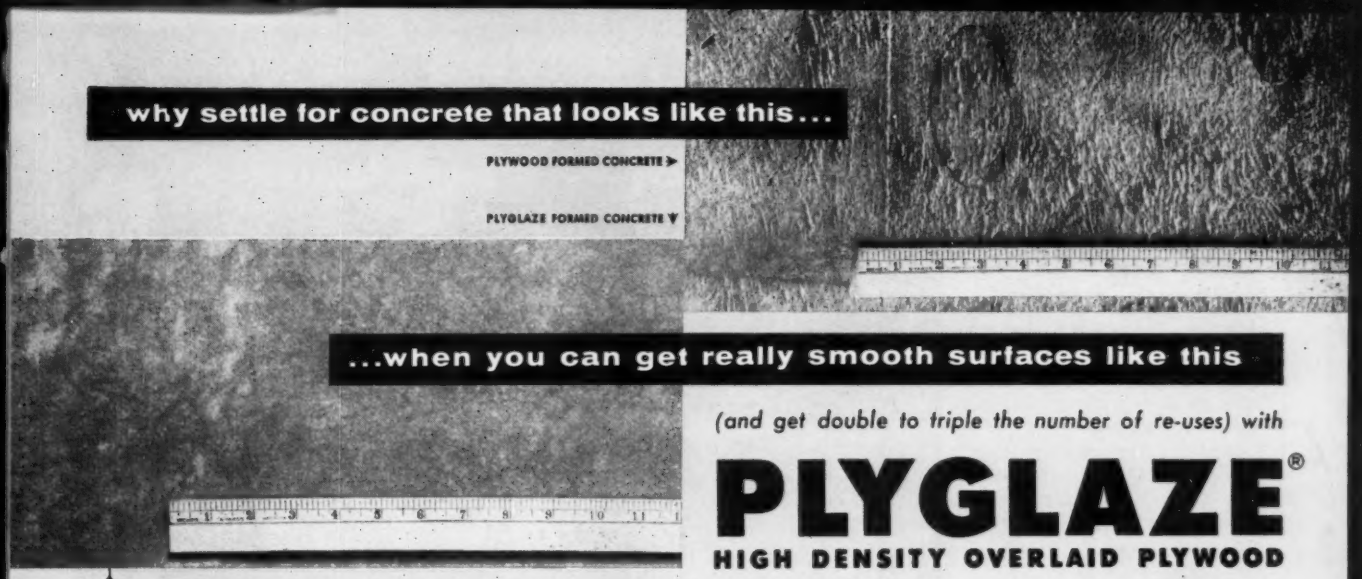

why settle for concrete that looks like this...
PLYWOOD FORMED CONCRETE
PLYGLAZE FORMED CONCRETE
...when you can get really smooth surfaces like this

(and get double to triple the number of re-uses) with

PLYGLAZE®

HIGH DENSITY OVERLAID PLYWOOD

If you have a job that calls for smooth architectural concrete—or if you can design forms to get 25 or more pours on the same or subsequent jobs—you can save money, time and trouble with PlyGlaze.

SMOOTHER CONCRETE—The unretouched photos above, taken right after stripping, show the big difference in concrete formed against ordinary concrete form grade plywood and PlyGlaze high density overlaid plywood.

PlyGlaze's hard, glossy-smooth surfaces form really smooth concrete every-time—unmarred by grain pattern, checks or plywood patches.

For jobs where architectural concrete is specified you can eliminate almost all rubbing and grinding, except for fins and tie holes. Ceiling slabs can be painted direct, without expensive plastering.

GIVES UP TO 200 RE-USES—With reasonable care, you should get from 50 to 75 re-uses with PlyGlaze. The limit actually depends on the form design and job requirements. Contractors who use panelized form sections with standardized tie-hole placements have reported getting several hundred re-uses.

CUTS COSTS—Although PlyGlaze does cost more initially than PlyForm grade Exterior plywood, it actually saves you money in the long run for these reasons:

1. PlyGlaze formed concrete needs much less finishing or sacking.
2. Oiling is not needed between pours other than to facilitate cleaning.
3. On jobs where form costs can be amortized over 25 or more pours, PlyGlaze actually costs less per foot of concrete formed.

COST PER-SQUARE-FOOT-PER-USE*

No. Re-Uses	10	25	50	100
PLYGLAZE	.037	.015	.007	.004
Exterior PLYFORM	.020	.008	Gives Max. 25 re-uses	

*Based on the average prices quoted by St. Paul & Tacoma Lumber Co. during 1957 for the following material delivered in Chicago: ¾" PlyGlaze, ¾" PlyForm, oiled, edge sealed.

SPECIFICATIONS, AVAILABILITY

Material: PlyGlaze is made by fusing a hard, glossy phenolic resin fiber to both sides of Exterior plywood. The overlay is not simply a coating that can work loose; it is fused under heat and pressure to become an actual part of the panel. It is more durable in every way than the wood itself.

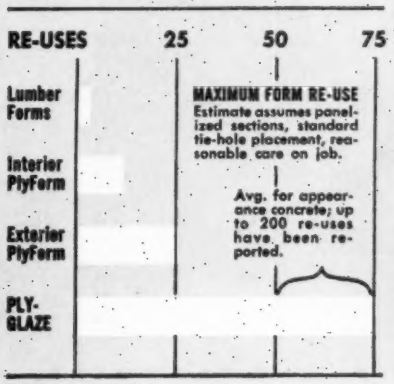
Base panel is top quality DFPA-inspected solid core Exterior plywood. It is sanded *before* overlay is applied, assuring uniform thickness.

Sizes: (standard and custom) PlyGlaze is available in all standard plywood sizes and also can be custom-sized to your exact specifications.

Source of supply: PlyGlaze is available anywhere in the country; write for name of nearest representative. It can also be specified in lieu of ordinary plywood with most patented forming systems.

POINTS IN BRIEF

- Has the strength, workability and adaptability of Exterior PlyForm.
- Strips easily; the hard non-absorbent surfaces will not stick to the concrete.
- Overlay will not soften or come loose.
- Overlay minimizes moisture pick-up and resultant loss of rigidity.



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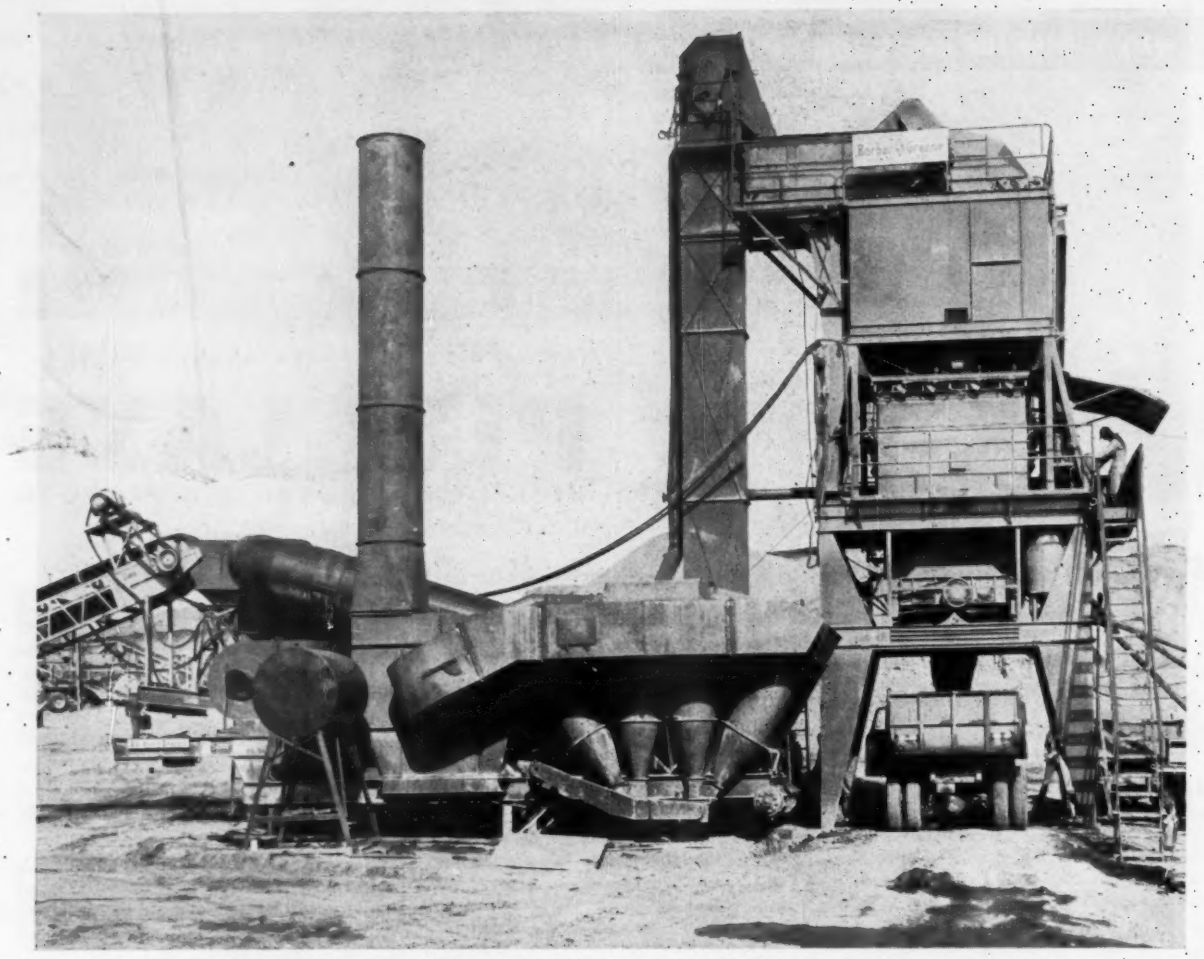

San Ore Construction Company's 6000-pound Barber-Greene Model 896 BatchOmatic, which has been set up at four widely scattered job-sites. Write for your copy of clearly illustrated *Principles of the BatchOmatic*.

Fast, low-cost moving . . . another BatchOmatic advantage

In its relatively short life this 6000-pound Barber-Greene BatchOmatic has worked on four widely scattered paving jobs. The fact that San Ore Construction Company could move this plant over the highway for these jobs is proof of the superior portability of the BatchOmatic.

The plant was initially set up at Caldwell, Kansas, where it produced mix for Sections 1 and 2 of the Kansas Turnpike. It was then moved about 200 miles to Ellsworth, Kansas, for another road project. The next and longest hop was about 500 miles to Fairplay, Colorado, for paving the upstream face of Montgomery Dam, a job that totaled only 20,000 tons. Its final move of the season was about 100 miles to Fountain, Colorado, for a highway resurfacing project.

Besides their unmatched portability, Barber-Greene BatchOmatics offer:

- Simultaneous measuring of all sizes of aggregate.
- Instant changeover from automatic to manual operation, and from manual to automatic.
- New Dyna-Mix Pugmill which gives thorough coating in less time than any other pugmill.
- Instant, positive inspection of aggregate gradation and weight.

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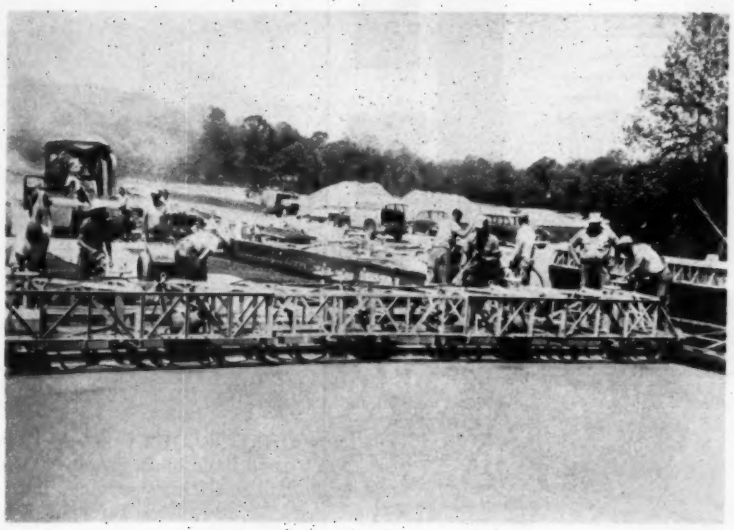
CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

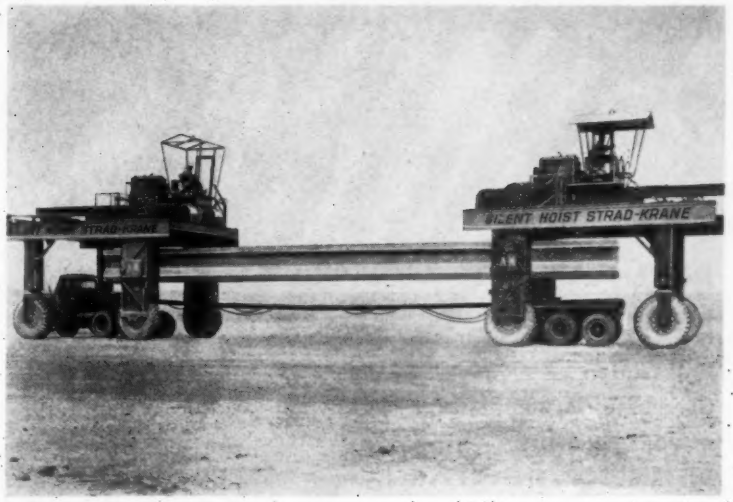


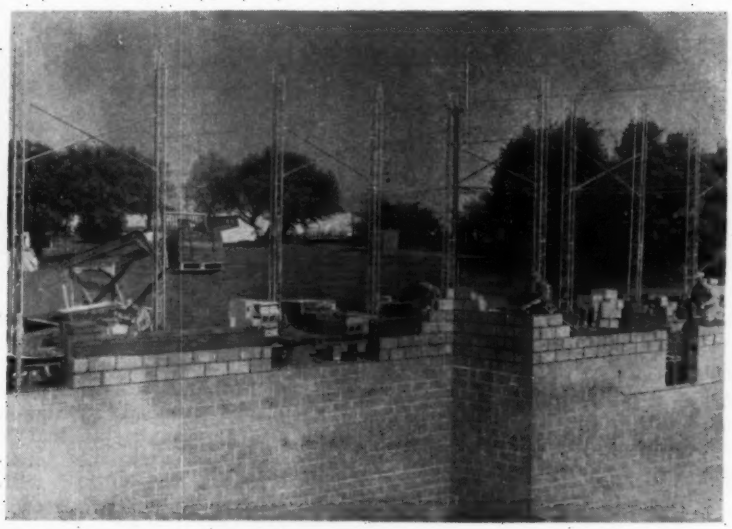
New Concrete Finisher For Bridge Decks

Not much can go wrong with Master Vibrator's concrete bridge deck finisher, which weighs less than 3,000 lb. As a 3/16-in. cable is reeled in, the finisher pulls itself forward at 2 to 6 fpm on 12-in. flanged wheels. A 3 kw generator furnishes power to two 1-hp vibratory motors. The adjustable strike-off, set ½-in. above grade, meters concrete to the L-shaped vibrators that are set ¼-in. below grade. The finisher can handle slabs from 15 to 31 ft wide. Crown and depth are controlled by crank screws.—**Master Vibrator Co., 17-52 Stanley Ave., Dayton, Ohio.**

Big Straddle Cranes Handle Huge Beams

American Marietta Co. is using new Silent Hoist Strad-Kranes to carry 100-ft long, 50-ton prestressed concrete beams. A crane hook can travel on a hydraulically powered hoist from one end of the machine to the other and also up and down. Power steering and brakes and 360-deg visibility are features of the machine, which is powered by a 450-cu-in. engine. Inside working clearance is 12x12-ft, which allows the machine to move over a big truck or freight car. Capacity is 25 tons. —**Silent Hoist & Crane Co., Dept. 153, 841 63rd St., Brooklyn, N. Y.**





Building Materials Rise With Masons

The carriage of Morgan adjustable scaffolding permits palletized material to be placed near the work platform by hand trucks or fork lifts. Because materials are elevated with the masons as the carriage base rises, costly rehandling is eliminated. The carriage is suspended on cables from the top of towers. A windlass raises the carriage without interrupting the mason's work. Planking and building materials remain in place. Material platforms are up to 6 ft wide.—**Morgan Mfg. Co., Yankton, S. D.**

continued on next page

BIG

CAP SCREWS

Need big CAP Screws — FAST?

Call Winton 1-4000, Cleveland, for the name of your nearest EARNEST DISTRIBUTOR. Sizes IN STOCK up to 2½" x 20", made to the most rigid quality specifications in the Industry.

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EQUIPMENT NEWS...

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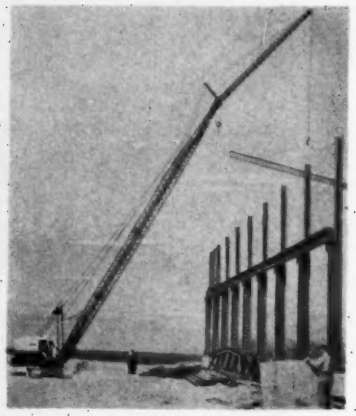
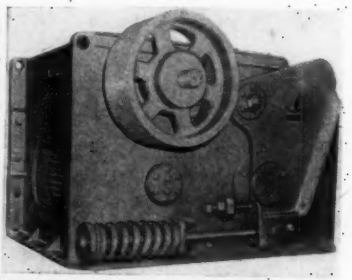
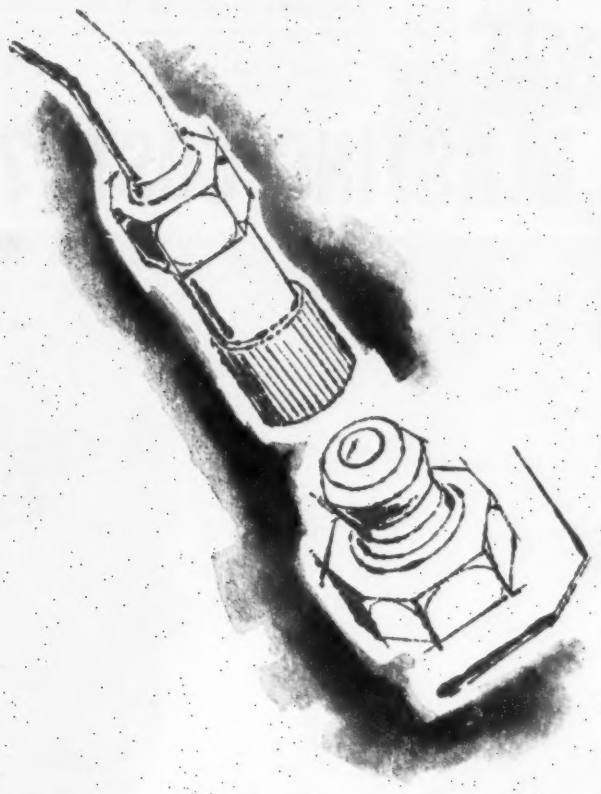


HEAVY DUTY — A crawler-mounted 30-B crane for heavy-duty lifting service has been introduced by Bucyrus-Erie Co. The heavy-duty crane, which uses the same upper works as the 30-B transit crane, has a higher capacity than the standard 30-B crawler-mounted unit. For one thing, crawler frames and axles are longer and wider. Standard treads on the heavy-duty machine are 30-in. wide and 36-in. treads are optional. The standard two-section, welded boom for crane service is 40 ft long. For longer booms, 5, 10, 20, and 30-ft inserts are available. A spring-cushioned, telescoping boom stop is standard and special boom-pin connection lugs are available to speed boom changes. Maximum load at a 10-ft radius with the 40-ft boom is 35 tons. Main operating functions of the 30-B are air-controlled. — **Bucyrus-Erie Co., S. Milwaukee, Wisc.**



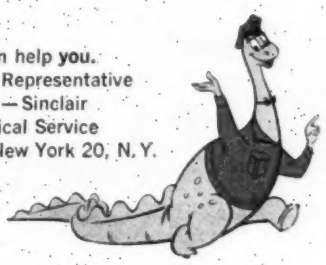
MANGANESE ROLLS — Eagle Crusher Co. has introduced two new roll crushers in sizes 24x20 and 30x34. Both crushers have manganese steel rolls that are turned by gears running in oil. Self-aligning, spherical roller bearings carry the rolls. The crushers can be had with two smooth rolls, two corrugated



Machinery... lubrication... and how to save money

Sinclair Litholine® multi-purpose grease gives many important advantages over ordinary industrial lubricants. For example, it eliminates the need for a variety of single-use greases. Furthermore, it has earned a reputation for water resistance and high temperature performance. Change to Litholine, now. And when management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

Find out how Litholine can help **you.** Call your nearest Sinclair Representative or write for free literature—Sinclair Refining Company, Technical Service Division, 600 Fifth Ave., New York 20, N.Y. There's no obligation.



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WHAT ARE YOUR ^ BLASTING COSTS?

Get a complete profit picture with new, free Blasting Cost Chart! Let the Atlas Man show you how

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EXPLOSIVES DIVISION
ATLAS POWDER COMPANY

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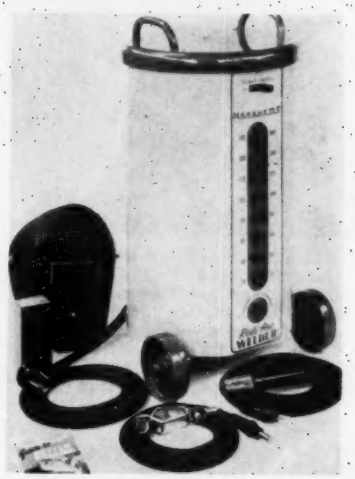
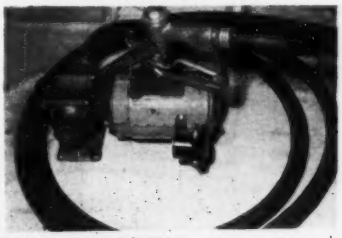
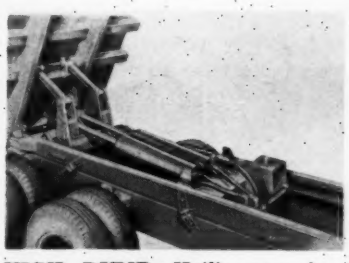
rolls, or with one roll of each type. Through heavy-duty tension springs, one roll is fixed and the other floats. This feature supplies ample crushing pressure, yet it relieves undue strain caused by tramp iron and other foreign materials. Adjustment of the opening between the rolls (up to 3 in.) is accomplished by screws on either side. The 24x20 crusher, which weighs 12,000 lb, requires a 75 to 125-hp engine and the 30x34 crusher, which weighs 16,000 lb, takes a 100 to 200-hp power plant.—**Eagle Crusher Co., Galion, Ohio.**



FOR SMALL SHOP—A compact, all-purpose, portable 180-amp arc welder that is designed for use in small shops where the work load is not heavy has been added to the Marquette line. Called the Redi-Arc EW65N, the compact machine unit is adaptable for welding, brazing, cutting, hard-facing, and heating jobs. It is easy to operate and it is built to withstand rugged service. The welder has an oversized transformer to provide added efficiency on low-voltage power lines. Its 25 to 180-amp range has volt-ampere ratios balanced for each heat stage. Controls are clearly marked. A simple switch-over selects welding amperage. The Redi-Arc welder is sold as a low-cost package unit that includes a flexible ground cable; a welding cable with insulated electrode holder; 8½ ft of three-wire power cable with plug; wall receptacle; welding helmet; and instruction book. —**Marquette Mfg. Co., Inc., 307 E. Hennepin Ave., Minneapolis 14, Minn.**



BATTERY PUMP—A new transfer pump that operates off a 6 or 12-v car battery will deliver from 1 to 500 gal of fuel or oil at a maximum rate of 15 gpm without spillage or contamination. The pump, which operates off any car battery drawing from 100 to 110 amps, is self-priming and is push-button controlled from the nozzle outlet. The transfer pump has a standard ¾-in. discharge hose and a 1-in. suction line. With a 1-in. discharge line, the pump will deliver up to 22 gpm. A meter can be installed in the line to determine the exact amount of liquid pumped. The unit is simple to install and wearable parts can be replaced easily. —**Transfer Pump Co., Osborn, Idaho.**



HIGH DUMP—Heil's new hydraulic dump truck hoist will tilt a dump body to a maximum of 70 deg. The unit includes a double acting hydraulic system that powers the body upward and also pulls it down to where gravity can take over and lower the body to its carrying position. Twin 8-in. dia cylinders have a 24-in. stroke. The hoist's double lift arms stabilize the body and truck during dumping. The hoist will fit any heavy-duty truck with a standard frame. It is adaptable to both on and off-the-highway trucks. The 70-deg dump angle makes it particularly suited for rock and quarry bodies, and for handling unusually wet loads. Because the pressurized hydraulic system keeps cylinders full of oil at all times, the size of the oil reservoir is kept at a minimum.

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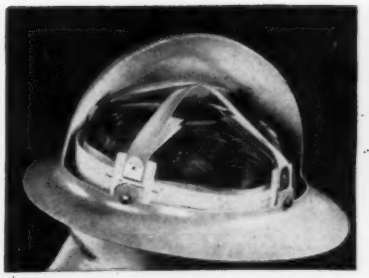
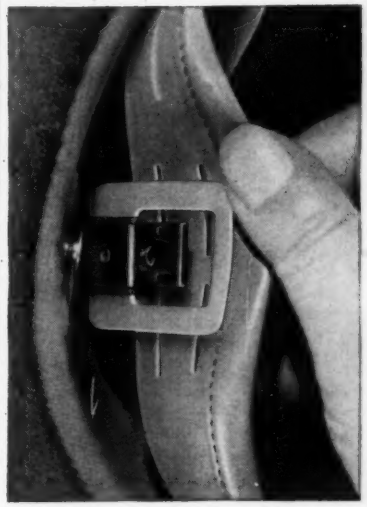


ANOTHER BENEFIT OF MSA'S NEW HAT SUSPENSION

EASY TO INSERT
EASY TO REMOVE



MSA's new double cradle suspension for Skullgard Hats and Caps gives you "Fixed-Crown" clearance and adjustable comfort.

Item: One of the big advantages of this new suspension is its *speedy insertion and removal* in the field. Four wide snaps provide a positive spring steel lock-in catch, so there's never any accidental detachment. These snaps are recessed for greater comfort and permit easy removal of the suspension for sterilization.

Other features include: handy locked-in suspension; no pressure points; air cushion sweatband; fast size adjustment; clean, long-wearing plastic webbing.

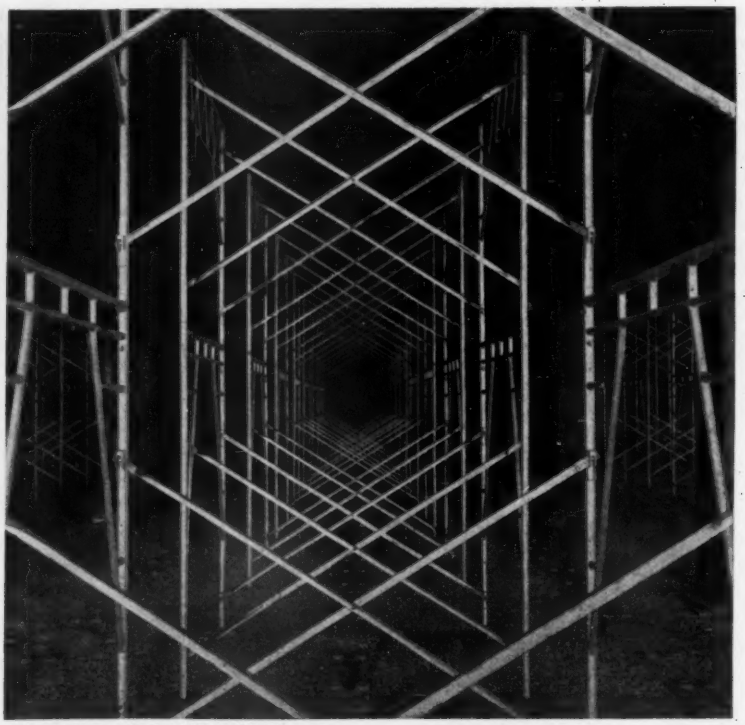
Write for new bulletin for details.

MSA
SAFETY EQUIPMENT HEADQUARTERS

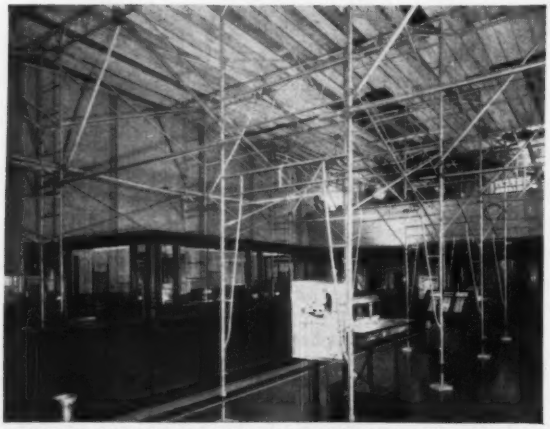
MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue
Pittsburgh 8, Pennsylvania

Scaffolding Methods . . .

A Picture Report on Efficient Ways to Scaffold, and Shore Concrete . . . by Patent Scaffolding Co.



NEAT, QUICK SLAB SUPPORT—Simple, easy-to-handle parts of prefab "Trouble Saver" Sectional Steel Scaffolding fit together rapidly to form this neat, efficient and safe, slab shoring for nine floors and roof of the new Southwestern Bell Telephone Co. Bldg., Fort Worth. 396 5'-high deep-trussed frames, 396 6'6"-high shallow-trussed frames and 396 3'-high deep-trussed frames are assembled with diagonal braces, fast-acting, patented SlideLoks and bases to the exact height required for the slab forming work. Neatness of job conditions undoubtedly contributed to time savings and safety for the contractor, Henger Construction Co.



HIGH FRAMES PERMIT BANKING AS USUAL—Providing for banking conditions as usual, during ceiling alterations for the Fidelity Union Trust Co., East Orange, N. J., is no trick at all for general contractor, Robert A. Howie, Jr. & Sons. 10'-high frames of "Trouble Saver"® Scaffolding, not only provide the ceiling-height working platforms, but also permit ample walk-through space for banking activity on the floor.

PIER SHORING ALSO MAKES FORMING SCAFFOLD—By assembling "Trouble Saver" Shoring 2'-wide ladder frames in 16'6"-high towers spaced 1'8" apart in one bay and 11½" apart in the other bay of this pier, two purposes are achieved. One, ample shoring support for a 3'9"-wide by 5'4"-deep concrete beam. Two, adequate platform area for forming work. Robert M. Murray, Inc., contractor for Horseheads Highway bridge job, East Corning, N. Y.

Complete scaffolding equipment and engineering service offered through nation-wide sales offices or representatives. Look under Patent Scaffolding in the Yellow Pages for your nearest source.

SALES **RENTALS**

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

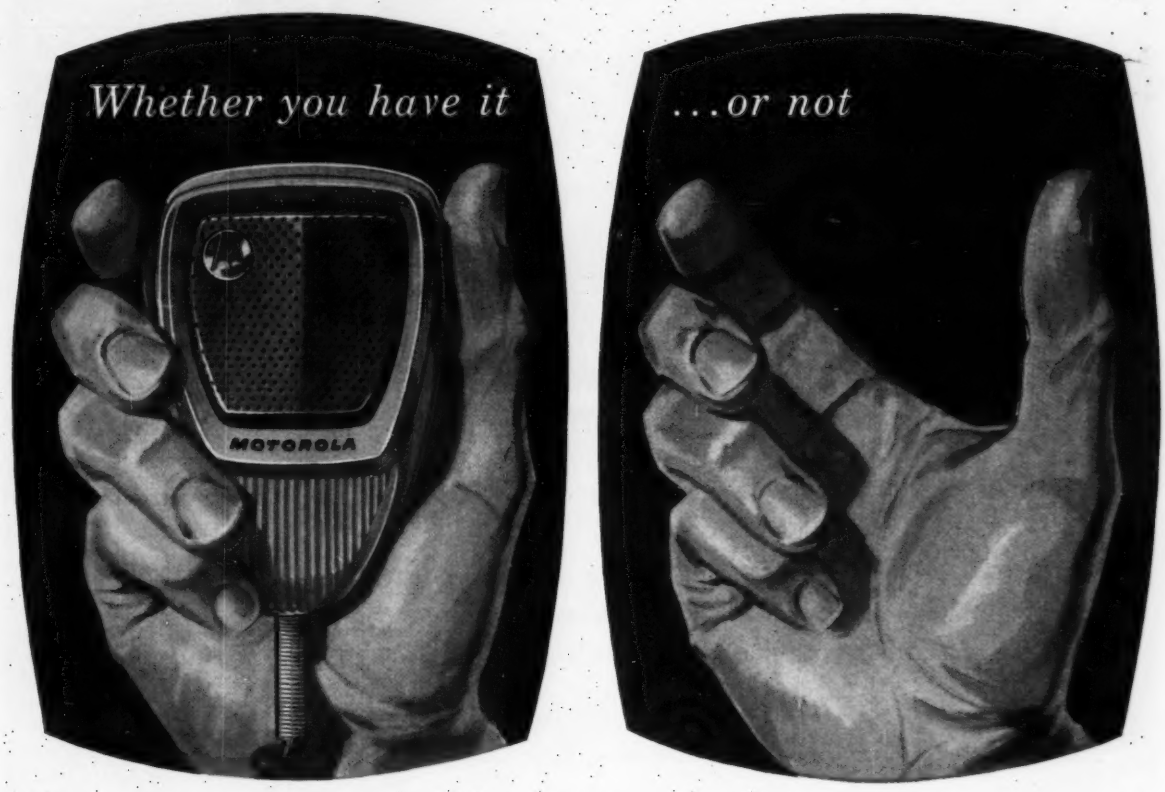
GOLD MEDAL LADDERS SCAFFOLDING

THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. CM&E, Long Island City 1, N. Y.

1550 Dayton Street, Chicago 22, Illinois • West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.

In Canada: 355 Dufferin St., Toronto • Branches in all Principal Cities



YOU ARE PAYING FOR 2-WAY RADIO

The cost of *not* having 2-way radio is actually taking dollars out of your pocket every day . . . *more* money than it would cost to own your own Motorola 2-way radio system. Here's why!

Drivers radio in direct from their vehicles—*save* the delay, inconvenience and cost of telephoning. With radio contact, you can move your drivers *directly* from job to job—as they *save* miles, they also *save valuable time*. There's less back-tracking, less "dead-heading"—more efficient use of drivers and vehicles.

AND HERE'S PROOF. Even if your truck costs are as low as $4.00 an hour ($2.00 for driver and $2.00 for truck)—saving as little as *3 minutes* an hour will more than pay for your Motorola radio. Figured on a mileage basis (at a minimum cost of 7c per mile)—saving as little as *10 miles* a day for each truck will pay for more than half of the cost of your Motorola 2-way radio system.

Get the full money saving, money making story on Motorola 2-way radio . . . complete product line—engineering service—installation—maintenance—lease/finance plans, for every need.

MOTOROLA 2-WAY RADIO

Motorola Communications & Electronics, Inc. • A Subsidiary of Motorola, Inc. • 4501 W. Augusta Boulevard, Chicago 51, Illinois

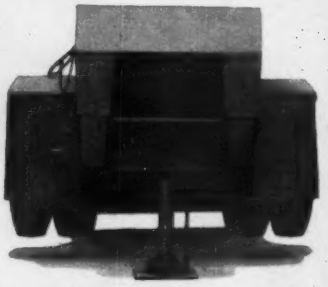
If you want top performance and who doesn't ?

YOU NEED A

ROGERS

Hydraulically Operated
THPG HYDRAU-LIFT
Detachable Gooseneck

TRAILER



PATENT NO. 2590210

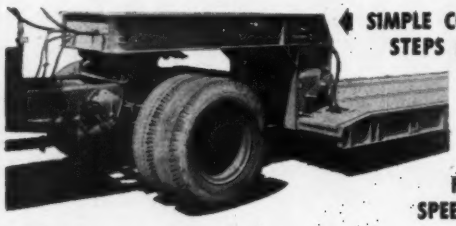
UNUSUAL PERFORMANCE in operational advantages and STRENGTH in structural design, features common to all Rogers Trailers, assure long, satisfactory service.

The new HYDRAU-LIFT Detachable Gooseneck by Rogers—the pioneer builders, provides fast, dependable, versatile performance not available in any other trailer.

Ability to detach, load the trailer and reattach the gooseneck is an outstanding feature. Man-saving simplicity of control, is greatly appreciated. Other valuable, exclusive features are incorporated.

FLAT TOP TO CARRY DIPPERS, ETC.

TAPERED DECK SIMPLIFIES LOADING



SIMPLE CONTROL SAVES STEPS AND AFFORDS VIEW OF ALL OPERATIONS

QUICK DETACHMENT FEATURES HELP SPEED OPERATIONS

Packy Says:
"Discard expensive, outdated equipment and buy a Rogers HYDRAU-LIFT with the savings."

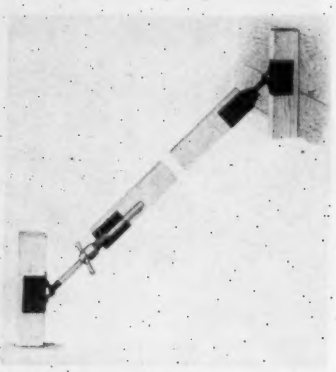
You'll want the many advantages of a front loading trailer.

Investigate and you'll buy a ROGERS THPG Detachable Gooseneck Trailer with its exclusive patented hydraulic operation.

ROGERS BROTHERS CORPORATION
ALBION, PENNA.
Export Office / 50 CHURCH ST., NEW YORK 7, N. Y., U. S. A.
Cable Address: Brosites

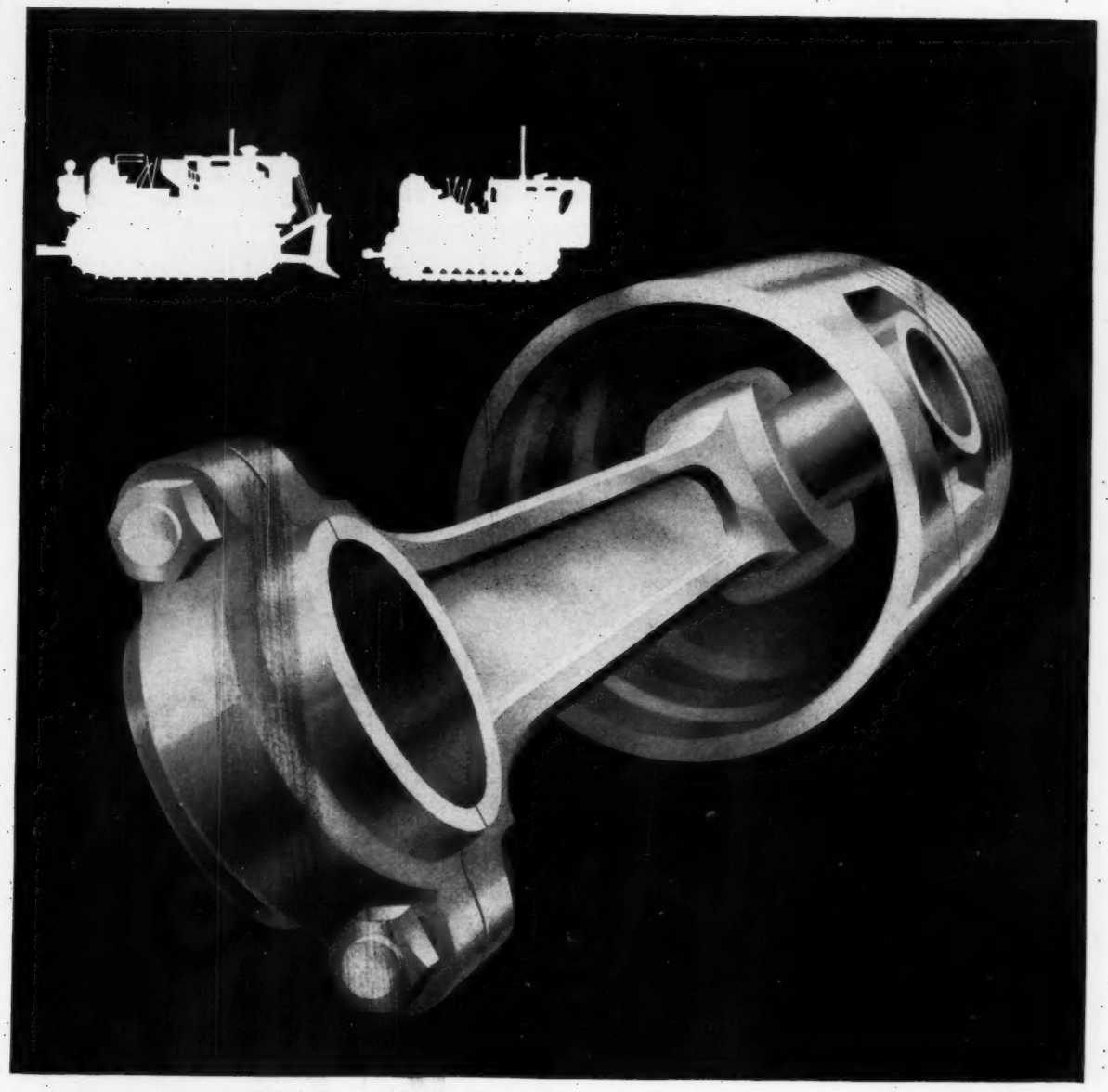
EQUIPMENT NEWS... continued

The hoist is recommended for use with Heil H-60 rock bodies or H-11 heavy-duty contractors' bodies.—**Heil Co., Milwaukee 1, Wisc.**



ADJUSTS FORMS — Superior's new Adjusta-Brace permits preliminary or final form adjustments without disturbing braces. The device consists of two sections that are joined by the contractor with a 2x4 or 2x6, or 1-in. pipe of any practical length. One section is nailed to a stud or waler on the form and the other section is attached to a stake. The adjustable section, which is usually the one attached to the stake, has a patented double-wing nut that works up and down a 1-in. dia rod. This rod is threaded to provide up to 12 in. of adjustment. Both the non-adjustable and the adjustable brackets are designed so that they work as universal joints. This feature allows them to take any position required for the form adjustment.—**Superior Concrete Accessories, Inc., 9301 King St., Franklin Park, Ill.**

IMPROVE TRACTORS—Several new attachments for D4 and D6 tractors have been introduced by Caterpillar. In-seat starting, with all controls for the gasoline starting engine mounted on the dash, is now available for the D4. The in-seat starting system is available as factory equipment on a new tractor or it can be installed in the field on older machines. A new high-ambient temperature radiator for both D4 and D6 tractors operating with front-mounted hydraulic equipment in atmospheric temperatures over 100 deg. F. is also available. These radiators are not recommended for tractors working under normal conditions, but they are effective in situations where over-



cut deposits, overhauls—and costs

Heavy-duty Estor D-3 was formulated especially to meet the extreme demands of diesel tractors that require a "series 3" lubricant.

Its powerful detergent action works *full-time* to fight the formation of hard carbon, crankcase sludge, gum and other dangerous deposits. Estor D-3 will even help dissolve gum deposits that may have previously been formed.

Because Estor D-3 keeps engines so clean, an effective power seal is always maintained between pistons and cylinder liners. Result: *full power, outstanding fuel economy—and long overhaul cycle.* Contractors using Estor D-3 report substantially reduced operating costs. In many cases, further savings can be realized by standardizing on Estor D-3 for *all* diesel earth-moving tractor equipment.

To get the best performance on your job by using Estor D-3, contact your nearest Esso office in New England, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, the Carolinas, Tennessee, Arkansas, Louisiana, and the District of Columbia. Or write: Esso Standard Oil Company, 15 West 51st St., New York 19, N. Y.

ESTOR® D-3

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ESSO RESEARCH works wonders with oil

Another Winning Combination

Ingersoll-Rand
COMPRESSOR

...and CONTINENTAL RED SEAL POWER

Year after year, Continental's famous dependability goes on building product acceptance for leading manufacturers of equipment. Here, for instance, an Ingersoll-Rand 85-cfm Rotary Compressor with Continental F-140 engine operates a PB8A Paving Breaker, using moil points, clay spades, and tamping bits, on a job in upstate New York. You cut costly down-time . . . do more work . . . with dependable Red Seal power.

CONTINENTAL MOTORS · Power for the Nation · AMERICA'S STANDARD

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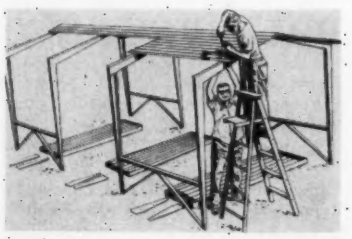
Continental Motors Corporation
MUSKEGON · MICHIGAN

CONTINENTAL IS ON THE MOVE IN 1958

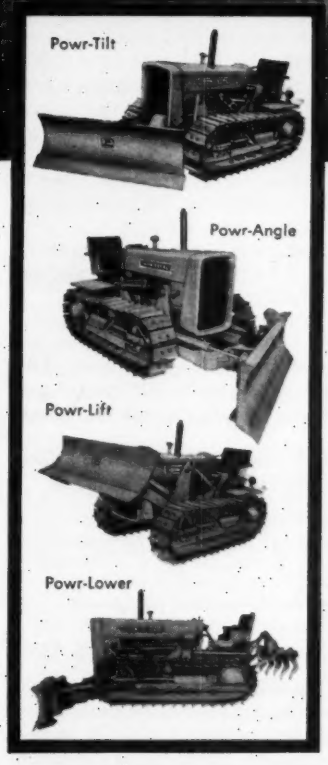
heating is encountered due to high temperatures and a restricted air flow caused by front-mounted equipment. Caterpillar also has increased the capacities of fuel tanks on the D4 and D6. Both tractors now can carry more than enough fuel to work a 10-hr shift at full load without refueling. The new 45-gal D4 fuel tank holds 15 gal more than the previous tank. The D6 tank has been increased 25% in capacity to 60 gal. — **Caterpillar Tractor Co., Peoria, Ill.**

SAFETY HOOKS — Crosby-Laughlin hoist hooks now can be converted to safety hooks in minutes. The manufacturer has made available a special latch kit—available to match every size of Crosby-Laughlin eye and shank hooks — that attaches easily through the drilled cam forged above the hook throats. Loads cannot slip off or be jarred loose when the safety latch is installed. The kits, consisting of latch, spring, bolt, and self-locking nut, are available for hooks ranging from 1/3 to 150 tons in capacity. Kits for swivel hooks with up to 22 tons capacity are also available. — **Crosby-Laughlin Div., American Hoist & Derrick Co., Box 570FX, Fort Wayne, Ind.**



PRE-FAB SHACKS — Childers Mfg. Co. has developed a line of steel structures designed to meet most construction job small-building needs. The steel buildings make ideal field offices, tool sheds, garages, and repair shops. They are available in 10 or 20-ft widths and in any length made up of increments of 6 ft. The units

TILT, ANGLE, LIFT, and LOWER with just a touch of the levers...



The NEW JOHN DEERE All-Hydraulic DOZER

THE first in its field—and the most versatile, easiest-to-operate dozer in industry—the new John Deere fully hydraulic 64 Dozer!

Just a touch of the proper control lever and the new 64 responds quickly and positively to your command. Tilting, angling, lifting, and lowering—even while you're on the go—each in a swift, sure motion that adds up to maximum operator control and convenience, lower earth-moving cost, and a better, faster job.

The 64 is built to "take it" on all types of industrial work. Heavy boom is of 1/2-inch material, box-welded and reinforced. The two hydraulic cylinders provide angling up to 25 degrees, right or left. Heavy 1-3/4-inch angling pivot pin is hardened for long life; angling frame attaches directly to blade. Heavy-duty 80-inch blade is box-welded and properly curved to produce maximum rolling action for best work. A single double-acting cylinder tilts the blade 7-3/4 inches to right or left. Two double-acting cylinders raise and lower the blade (37 inches above ground, 11 inches below.)

Combined with the outstanding economy and performance of the John Deere "440" Crawler, the 64 is a unit that will appeal to any earth-moving contractor, large or small. See your nearest John Deere industrial dealer.

JOHN DEERE Industrial Tractors and Equipment

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Please send me additional information on No. 64 Bulldozer and the John Deere Credit Plan.

Name_____

Address_____

City_____ State_____

W. L. Johnson Construction builds $30 million of highways, dams in five years with

Part of Johnson Company's fleet of scrapers shown in action on the state highway project, Fairfield County, Route 33, Ohio. $2 million project includes grading, drainage, 325,000 yds. of excavation, 110,000 sq. yds. of paving, 2 bridges, and ran 4 miles.

Port Columbus Municipal Airport, $1.7 million project. Johnson contracted for paving, grading and excavating. $7 million terminal is shown above. Johnson paved apron and taxi way around the new terminal. Included 65,000 sq. yds. of 13" concrete, and 10,000 sq. yds. of 9" concrete. One of Johnson's 4 Koehring pavers is shown above.

$300,000 a year is spent for Johnson's equipment maintenance. Complete overhaul of all equipment is done periodically. Complete engine rebuilding is done including reboring of cylinders. "The efficiency of equipment maintenance spells the difference between profit and loss," says senior partner, Fred Rowe.

■ Heavy construction contract awards have scored the sharpest recovery ever recorded. The unprecedented rally from the 1957 nosedive pushes the seven months total of '58 to $13.2 billion, 6% above the same period of 57.

As the 1958 construction upsurge takes on boom proportions, contractors will be taking on more and more work. This means increasing purchases of equipment and materials by contractors in order to achieve increased production and complete the required work. All signs point to greater volumes of work and corresponding prosperity for the construction industry in the months and years ahead.

Role of contractors grows bigger and bigger

Construction volume is increasing faster than the number of contractors. In the period 1947-57, contract awards increased 260%, while the number of contractors doing $100,000 or more per year increased only 114%. Contractors are stepping up their productivity and equipment inventories in order to keep pace with the demands of construction.

One of the 9,234 contractors who received over $100,000 in contract awards in 1957 is the **W. L. Johnson Construction Co. & Assoc. of Columbus, Ohio.** This contractor has a long and outstanding record in the construction industry...dating back to 1920. At the death of W. L. Johnson, founder, in 1925, the organization was taken over by Mr. Fred I. Rowe who retained the Johnson name. As the organization grew and prospered, Mr. Rowe developed and encouraged his key supervisory personnel.

In 1942, he established a partnership which now consists of F. I. Rowe, James E. Brissenden, Douglas H. Criswell, Richard M. Tangeman, Gardner Tillson and Paul Scott.

The Johnson Company originally contracted for concrete and macadam road work. Today, its construction operations include airports, dams, railroads, earthmoving and highway work. Like most contractors, Johnson Company is highly mobile extending its operations from Ohio to Michigan, Indiana, Kentucky, Kansas and Missouri.

A permanent staff of some fifty people is backed up with some 600 workers at the peak of Johnson's construction operations.

Profile of the W. L. Johnson Company

- completed $6,000,000 of construction in 1957
- $30 million in five years
- owns and operates over 350 units of equipment valued at $4 million
- purchased $300,000 worth of new equipment in 1957.

Most of the work performed by this contracting firm is for the federal, state, and county governments. Fred I. Rowe is senior partner and general manager of the company, but on all matters pertaining to the construction operation, planning and expansion, the partners function as a joint team.

"Many people in our company influence purchases of equipment," says Fred I. Rowe

The Johnson Company is constantly expanding its operations and equipment inventory. The purchase of new equipment is a very serious operation in this contracting firm. As senior partner, Mr. Rowe says, "equipment purchases result from a careful process of meetings and consultation of partners and other key personnel.

Company & Associates bridges, airports, and 350 units of machinery

Pictured above are partners Fred I. Rowe (left) and D. H. Criswell of the W. L. Johnson Construction Co. & Assoc., Columbus, Ohio. Mr. Rowe has been a subscriber to CONSTRUCTION METHODS magazine for 35 years and Mr. Criswell for 15 years.

We actually seek out the opinion of our job superintendents, equipment superintendent, and our equipment operators. I personally go into the field and ask the equipment operators what they think of different rigs, how they perform, and if they are doing the job intended. The opinions of all of these key people are carefully considered before our decisions are made."

$300,000 of new equipment purchased in 1957

Contractors like the Johnson Company are constantly on the lookout for new and better equipment with which to step up production and increase their profit picture. In 1957, an investment of $300,000 was made by Johnson for new machinery of different varieties.

W. L. JOHNSON CONSTRUCTION COMPANY & ASSOCIATES — COLUMBUS, OHIO
Equipment Inventory

4 pavers (Koehring)
5 aggregate batchers
80 trucks (Ford, Chevrolet, GMC, Reo) flat body, dump, and pick-up
20 crawler tractors (Caterpillar, Allis-Chalmers)
9 rubber tire scrapers (Caterpillar & Euclid)
7 tractor drawn scrapers
8 cranes & shovels (Northwest, Koehring)
3 transit mixers (Rex, Smith, Jaeger)
11 bottom dumps (Euclid)
2 trailers (Ford, Rogers)
2 Jeeps
3 portable welders
1 front end loader (Hough)
7 rollers (Huber-Warco)
10 sheepsfoot rollers (LeTourneau-Westinghouse, Gallion, Southwest)
2 Kompactors (Buffalo-Springfield)
1 rubber tire roller (Bros)
7 graders (Caterpillar, Adams)
2 road maintainers (Littleford, Huber-Warco)
20 compressors (LeRoi, Gardner-Denver, Ingersoll-Rand)
40 pumps (Jaeger, Kellogg, Gorman-Rupp)
35 generators (Kohler)
2 steam cleaners (Malsbary)
2 boilers
2 cranes, rubber tire (LeTourneau-Westinghouse)
3 spreaders (Blaw-Knox)
4 finishing machines (Jaeger)
3 longitudinal finishers (Koehring)
2 sub graders (Gar Wood)
4 concrete saws (Clipper and Target)
1 concrete pavement breaker (Novo)
3 ditching machines (Parsons, Buckeye)
5 rock wagons (Athey)
2 ripper and rooters (LeTourneau)
2 mass concrete vibrators (Maginniss)
1 mass earth vibrator (Jackson)
6 chain saws (Homelite)
3 trailers (Fruehauf)
2 D Roadster Tournapulls
3 grease trucks (GMC)
4 fuel trucks (GMC International, Reo)
2 rammers (Barco)
1 earth auger (Buda)

"I have been reading CONSTRUCTION METHODS magazine for some 35 years"... says Fred I. Rowe, senior partner, W. L. Johnson Construction Co. & Assoc.

Speaking of CONSTRUCTION METHODS, Mr. Rowe says:

"Life isn't long enough to learn everything I'd like to on my own. I learn a lot and get a great deal of experience from CONSTRUCTION METHODS magazine. I read a publication like this to learn what's new in equipment, techniques, materials and how they are used. It has done an excellent job of keeping up to date and ahead of the field. I also read the ads very carefully for ideas and news of new units. I also study the pictures carefully. Our key people subscribe to CONSTRUCTION METHODS, and I check periodically to see if they are reading certain articles. I have read this publication for some 35 years and I think it is one of the best in the field."

and D. H. Criswell, partner says:

"I like the way articles in CONSTRUCTION METHODS describe a project. I look to it for new ideas and products. I always look to the ads for equipment, supplies, safety devices, etc. that pertain to construction."

In addition to Messrs. Rowe and Criswell, the Johnson Company's four other partners subscribe to CONSTRUCTION METHODS magazine. Other important buying influences among the 21 paid subscribers in this firm include such people as foremen, engineers, equipment superintendent, master mechanic, and so forth. *As Mr. Rowe says, "they all exert some influence on the company's buying decisions."*

CONSTRUCTION METHODS PAVES THE WAY FOR EFFECTIVE SELLING TO THE CONTRACTOR MARKET

Personal selling to all the important buying influences in a contracting firm like W. L. Johnson is expensive, time consuming and often impossible. Contractors and their personnel are constantly on the move. Advertising is a necessary and effective sales tool that contacts these buyers, paves the way for your salesmen, creates product recognition and preference.

CONSTRUCTION METHODS magazine is read by over 46,000 paid subscribers, 64% of whom are key personnel in contracting firms both large and small. If the object of your advertising is to help your salesmen and distributors make more sales at lower cost per sale, CONSTRUCTION METHODS deserves a permanent place on your advertising schedule.

Construction Methods AND EQUIPMENT
ABC ABP
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330 WEST 42nd STREET, NEW YORK 36, N. Y.

NEW FOR YOUR CONVENIENCE...

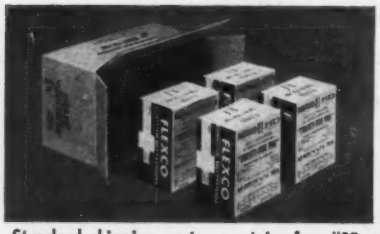
FLEXCO

"25-PAK"

TWENTY-FIVE COMPLETE SETS OF FLEXCO HD BELT FASTENERS NOW AVAILABLE IN ONE EASY-TO-HANDLE ECONOMY BULK PACKAGE

There's no need now to carry several 10-set boxes to the job—every "25-PAK" contains 25 complete sets of FLEXCO Fasteners (bottom plates, top plates, clips, nuts and bolts) . . . enough FLEXCO Fasteners to join common belt widths (for example: one "25-PAK" box, size 1½E, will join a 36" belt.) Our savings from bulk-packaging are passed on to you!

Label on each "25-PAK" box has chart indicating the number of FLEXCO HD Fasteners to use for given belt widths.



Standard shipping carton contains four "25-PAK" boxes of one size fastener. Keep a supply of "25-PAKS" on hand. Easy to store and inventory, sturdy boxes and shipping cartons have many uses.

Ask your FLEXCO distributor or write to us for additional information.

Flexible STEEL LACING COMPANY

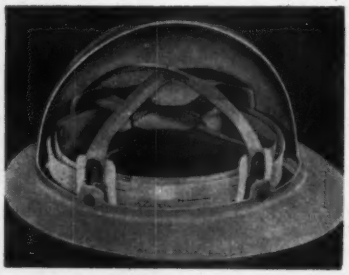
4677 LEXINGTON ST. • CHICAGO 44, ILL.

FOR THE SPLICE OF A LIFETIME

EQUIPMENT NEWS... continued

are sold as a do-it-yourself package of prefabricated, fully galvanized steel parts. Unskilled laborers can put them up quickly and easy, according to the manufacturer. Pre-cut, pre-punched members fit together and are then bolted with hand tools. Every piece is small and light enough to be carried by one man. As the need arises, the buildings can be expanded in length by adding 6-ft sections. The buildings can be disassembled and moved to a new site when a job is finished—**Childers Mfg. Co., Houston, Tex.**

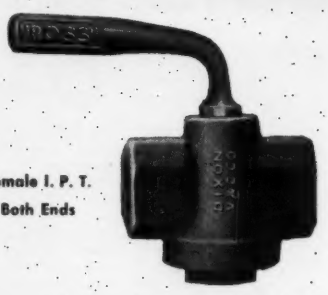
CABS AVAILABLE — Clark now offers a full line of all-weather cabs for Michigan 1¼ to 6-yd tractor shovels and 162 to 600-hp tractor dozers. The all-welded-steel cabs can be installed easily in the field. All windows are made of safety glass that is set in rubber molding. Rear windows and doors can be removed easily for summer use. The operator has an unobstructed view of the bucket or dozer blade at all times, according to Clark. Heaters, windshield wipers, and floor mats are available as optional equipment. **—Construction Machinery Div., Clark Equipment Co., Pipestone Rd., Benton Harbor, Mich.**



SAFER HARD HAT—A new suspension for the M-S-A Skullgard hard hat makes it virtually impossible for the wearer to adjust it improperly. The new "fixed crown" consists of a dual suspension within the hat. One sus-

Avoid One Cause of Air Line Leaks and Pressure Loss

"BOSS" Self-Honing AIR VALVES



Female I. P. T. Both Ends

Built to withstand the hard knocks of mining and construction service, "BOSS" Valves are also ideal for general use on pipe lines, hose lines, compressor tanks, etc., and for the handling of water. They do not require packing.

Bronze plug firmly seated by spring tension against harder metal of valve body is automatically honed to perfect seat as handle is turned. A straight, full-flow opening extends through valve body and plug, providing greater capacity with no friction loss. Valve opens or closes by a quarter turn of the handle.

INTERNALLY ATTACHED HANDLE—In sizes ¾" to 1½" valve stem and handle are combined in a strong one-piece forged steel unit which is anchored to the bronze plug within the valve body. This patented feature eliminates stem and handle breakage. Sizes ¼", ⅜", ½" and 2" have externally riveted handles.

Male I. P. T. Both Ends

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON Valve & Coupling Co.

GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.

BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON

DIXON VALVE & COUPLING CO., LTD., TORONTO Associate Companies

Buck Iron Company, Inc., Quarryville, Pa. · Precision Drawn Steel Company, Camden, N.J.

EUCLID S-7 VERSATILITY PAYS OFF ON SCATTERED JOBS

Henry Miesz Excavating Co., Inc. of Cleveland, Ohio, had crawlers and pans but realized the need for faster, more versatile equipment to efficiently handle their relatively small earthmoving jobs located in the greater Cleveland area. Four Model S-7 Euclid Scrapers were added to their fleet. Since then these units have worked some 2000 hours each on varied dirtmoving contracts.

Tops for Job-hopping

In a recent four month period, the versatility and fast movement from job to job of Miesz's "Eucs" helped complete the following jobs:

Basement excavation and leveling for manufacturing plant and office—then 23 miles to warehouse and equipment yard grading—next, 32 miles to a golf course and 8 miles to another one—then 28 miles to a factory site—38 miles further to a third golf course—52 miles back to a shopping center—then 29 miles to a motel site—and 23 miles to a research laboratory site.

Many Advantages

Vice President "Bill" Miesz and Chief Engineer Bob Keidel report many instances where advantages of the S-7 have helped them. Using these handy scrapers for rough excavation of basements saves time. On one job, being able to cross a newly paved street with the "Eucs" saved them about half the cost of making the same haul with trucks. With widely spread jobs and spotty weather in the area, quick mobility of their scrapers enabled them to work the jobs that were dry and to operate more days during their work season.

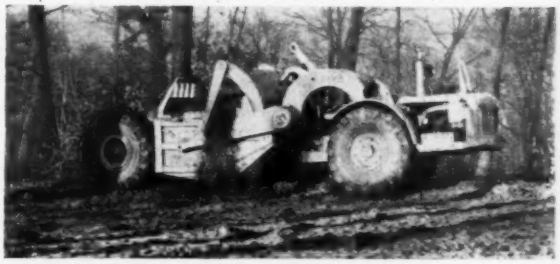
The job-proved versatility of the S-7 is another reason why ***Euclids are your best investment.***

EUCLID Division of General Motors, Cleveland 17, Ohio

S-7 EUCLID FEATURES

- **7 yd. struck capacity**
- **9 yd. heaped**
- **18.00 x 25 or 21.00 x 25 tires**
- **143 h.p.**
- **Torqmatic Drive or 5-speed transmission**
- **25 mph speed**

Mobility of this versatile "Euc" permits better scheduling of earthmoving on different jobs to get maximum production from the machine.



The S-7 maintains steady production despite close quarters and steep grades encountered at building site near main thoroughfare.

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

How a little give adds a lot of life to... AMSCO CRUSHER PARTS

Concave ring and mantle of this *Hydrocone* crusher are made of the toughest steel known... Amsco Manganese Steel. It *gives* a little, to take more punishment. *Hydrocone* is a registered trade-mark of the Allis-Chalmers Manufacturing Company.

Both mantle and concave ring crush a lot more feed because of certain properties of Amsco® Manganese Steel. The metal *gives* a little under crushing forces, absorbs stresses, resists cracking and chipping. Yet these same forces work-harden the surface of Amsco Manganese Steel to as much as 500 Brinell... a high hardness, stubborn to wear.

Amsco Manganese Steel Crusher Parts maintain their ductile undersurface and work-hardened surface even when worn thin. That's why Amsco parts endure severe abuse for so many work hours without letup.

To be sure of getting Amsco Manganese Steel, order replacement parts from your crusher manufacturer. Amsco makes manganese steel parts for most manufacturers of crushing, grinding and pulverizing equipment.

Amsco also produces other alloy steels with maximum wear resistance under particular service conditions

AMERICAN Brake Shoe COMPANY

AMSCO

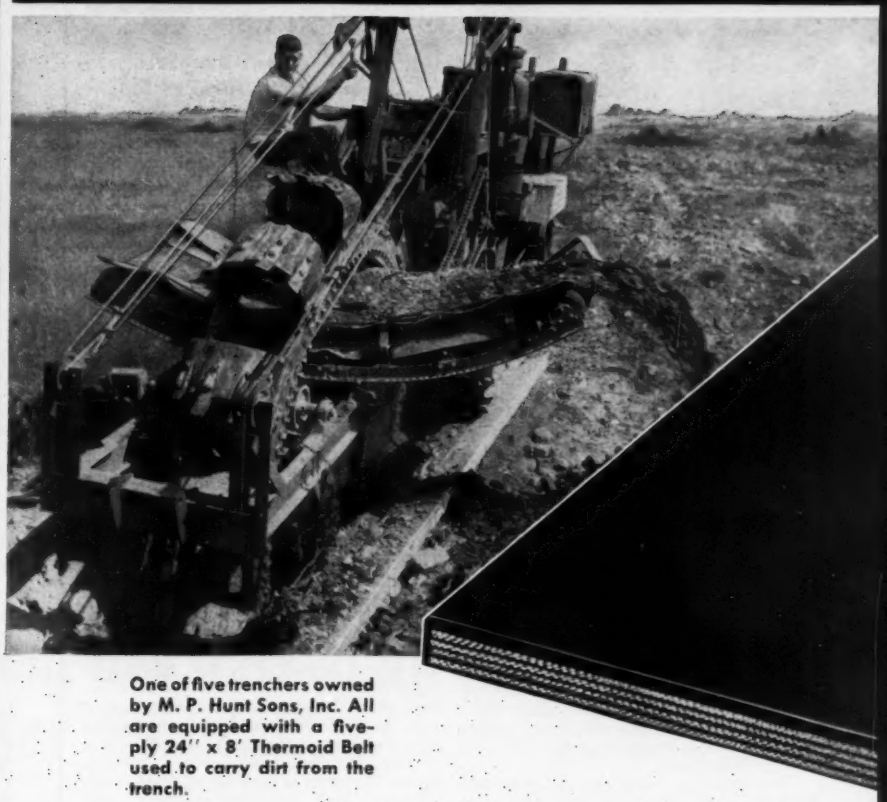
American Manganese Steel Division · Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

pension, which is permanent, assures the wearer of at least 1¼ in. of safety clearance, while the other suspension can be adjusted for comfort. The new design also eliminates pressure points that tend to make hard hats uncomfortable. The new suspension has four wide snaps recessed into the sweatband with lock-in catches that permit easy removal of the suspension while preventing accidental detachment. Size adjustments can be made in seconds. Skullgard shells with the new suspension are available in extra small, standard, and extra large sizes. The standard size fits about 95% of wearers.—**Mine Safety Appliance Co., 201 N. Braddock Ave., Pittsburgh, Pa.**

LIGHT HOIST — Engineered Equipment's new Auto-Vator and E-Z Up trailer combination forms a fully automatic, lightweight material hoist that can be moved from job to job and set up in minutes by one man. Erection costs are kept to a minimum and trucking worries are eliminiated because the hoist is constructed of lightweight aluminum. The trailer unit hooks on to any car or truck. When it is unhooked it tilts into working position and legs lock in place to form a stable A-frame tower. The tower reaches to a height of 40 ft and extensions are available. The Au-

Thermoid Belts last "at least twice as long"



One of five trenchers owned by M. P. Hunt Sons, Inc. All are equipped with a five-ply 24" x 8' Thermoid Belt used to carry dirt from the trench.

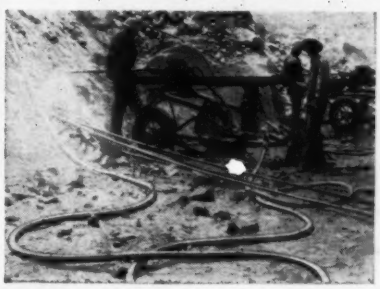
. . . is the on-the-job experience of Morris Hunt, who uses, among other equipment, five trenchers to dig septic tank underdrains, trenches for water and gas mains, and the like.

Mr. Hunt points out that hard clay, sharp pointed rock, stones, tin cans and other metal objects are generally encountered when digging a trench. These things, he said, "play havoc with any belt, and consequently most belts don't last too long. We tested several other brands and they lasted only about half as long as Thermoid belts."

Take a leaf from Mr. Hunt's book. You, too, will find that the added wear built into Thermoid Conveyor Belting keeps maintenance costs to a minimum, your operations *profitable* . . . right on schedule. *You can forget about downtime.* Call your local Thermoid Distributor for the conveyor belt best suited to your needs.

Cut costs with Thermoid Multi-V Belts . . .

. . . and Thermoid Powerflex Hose



Thermoid

Thermoid Company
Trenton, New Jersey • Nephi, Utah

Sauerman News Briefs

SPECIAL EDITION OF SAUERMAN NEWS

Brief items about the Sauerman Method... Crescent DragScrapers Slackline and Tautline Cableways... Durolite Blocks

Sauerman Bros., Inc. • 612 South 28th Avenue • Bellwood, Illinois, (Chicago Suburb)

DragScraper Uses Island for Parking Lot Fill

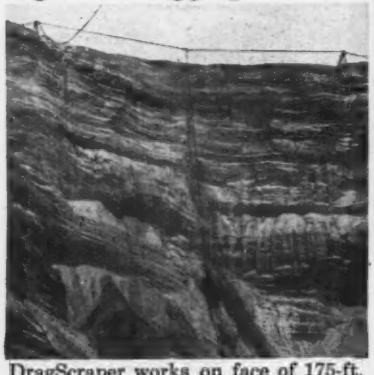
An island in the Kalamazoo River was used for parking lot fill by the Harrington Construction Co. of Fennville, Michigan. The job was handled by a Sauerman 3-yd. Crescent DragScraper and carrier assembly used with an Insley WB crane.

The hoisting line of the Insley served as track cable, running from the hoist drum through the middle sheave of the boom tip to a tree anchor on the island. The drag cable was attached to the front chains of the Crescent.

After digging and hauling to bank, the track cable was tensioned to lift the DragScraper and gravity return it to the excavation over 400 ft. away. Round trip took about a minute and a half. The 70-ft. crane boom was supported by two back stay cables leading from the boom tip to two tractors used as anchors.

(Condensed from Sauerman News No. 149.)

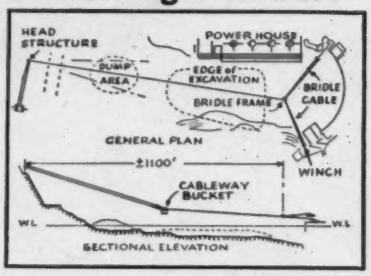
High Bank Digging



DragScraper works on face of 175-ft. bank, hauls load 600 ft. Rapid Shifting Tail Bridle changes line of operation.

(Condensed from Sauerman News No. 150.)

De-Rocking a Tailrace

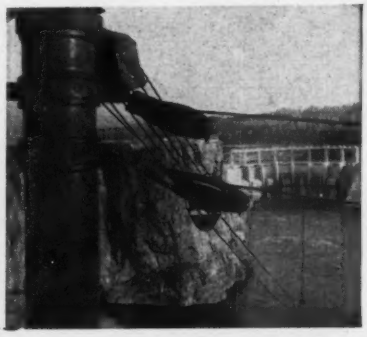


When the Washington Power Co. completed its Cabinet Gorge power plant and dam, an accumulation of rock at the discharge of the draft tubes had to be removed to insure unobstructed flow for the tailrace.

A Sauerman 2½-yd. Slackline Cableway, equipped with a rapid-shifting bridle system, was selected to do the job. Over 28,000 cu.yds. of rock varying in size from 6 in. to 5 ft. have been removed since the Slackline was installed. It is a permanent installation and is used periodically to clear the area in front of the draft tubes.

The Slackline operates on a 1000-ft. span. Material is excavated from 35 ft. of water and conveyed in the 2½-yd. bucket to a waste pile about 150 ft. below the tubular steel head mast. Power is supplied by a hoist located 190 ft. from the mast. The bucket and carrier assembly rides on a track cable, the lower end of which is attached to a rapid-shifting bridle frame controlled by a 10-hp. motorized spool-type winch. The rapid-shifting device permits the bucket's line of operation to be shifted laterally.

(Condensed from Sauerman News No. 143.)

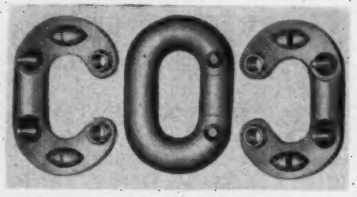


MORE NEWS AND INFORMATION

Issues of Sauerman News giving greater detail about the installations on this page are available on request. For full information, tell us your interest or requirements and ask for catalog. Contact Sauerman Bros., Inc., 612 S. 28th Ave., Bellwood, Ill.

EQUIPMENT NEWS...continued

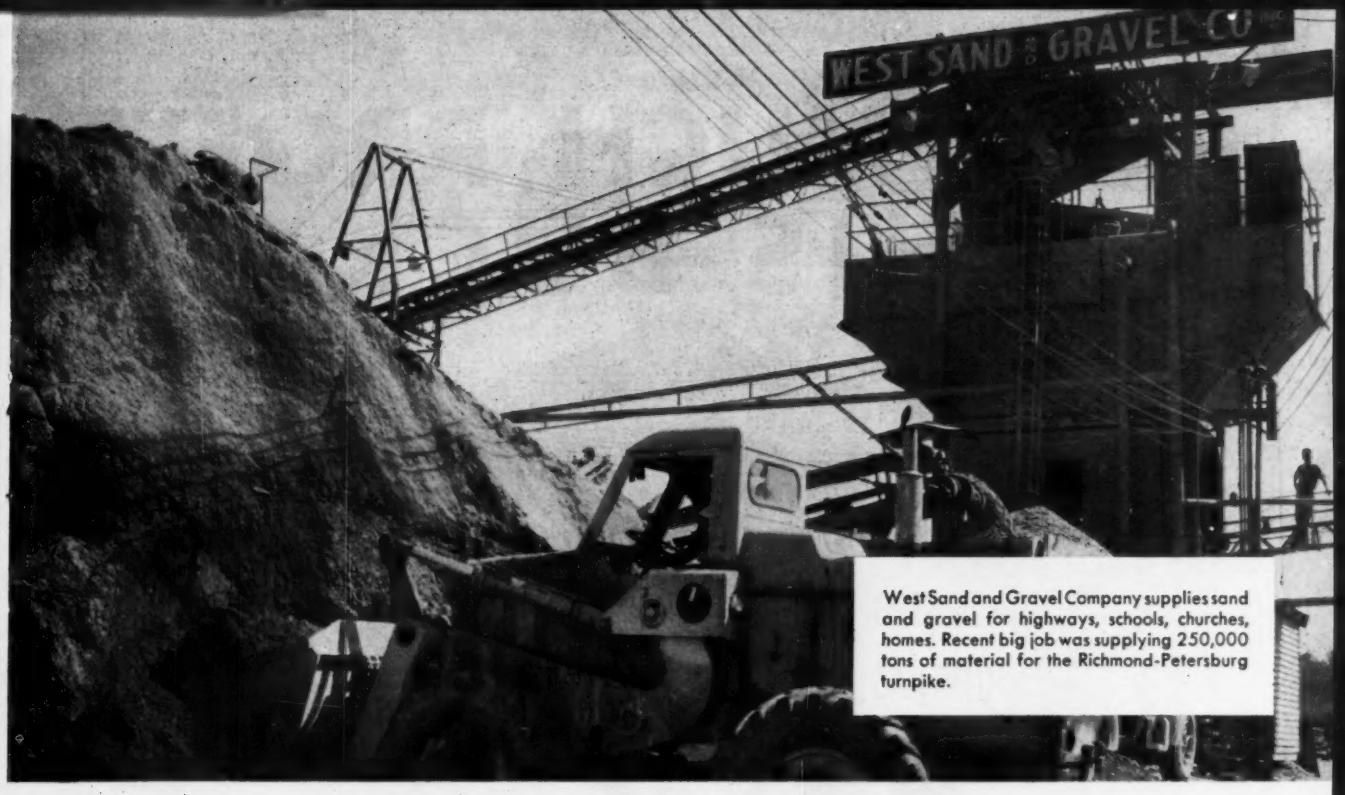
to-Vator features remotely controlled, adjustable platform stops and side unloading. It can be powered by a gasoline engine or an electric motor. — **Engineered Equipment, Inc., 1001 Linden St., Waterloo, Iowa.**



QUICK CONNECTIONS — Crosby-Laughlin Missing Links provide a quick and easy way to connect hooks, join swivels or rings to chain, or to repair broken chains. It takes just a few seconds to join the two halves of a Missing Link by simply peening them together. This results in a connection that is stronger than a welded one and safer than cast links, according to the manufacturer. The drop-forged, heat-treated halves have integral rivets and interlocking lugs that distribute the load evenly throughout the link when joined. Missing Links are offered in all popular chain sizes ranging from 3/16 to 1⅞-in. — **Crosby-Laughlin Div., American Hoist & Derrick Co., Box 570FX, Fort Wayne, Ind.**

LOW-COST ELECTRODE — A new high-speed welding electrode —especially practical as a low-cost built-up rod and for underlaying specialized hard facings— has been introduced by Marquette Mfg. Co., Inc. Almost universally adaptable, the No. 175 Build-Up-Rod is a medium carbon, low-alloy electrode with a powered metal coating. Easy to use, No. 175 can be applied by the drag technique or by using a free arc.

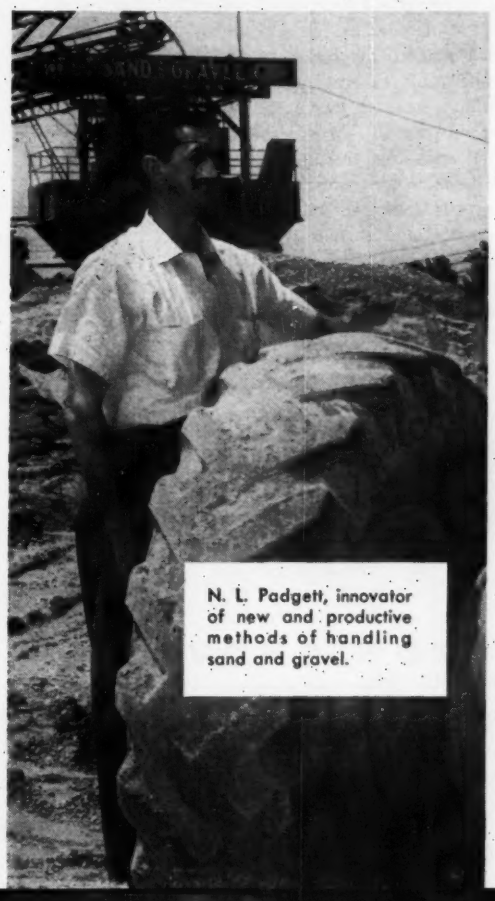
continued on page 185



West Sand and Gravel Company supplies sand and gravel for highways, schools, churches, homes. Recent big job was supplying 250,000 tons of material for the Richmond-Petersburg turnpike.

"Our equipment has worked up to 18,000 hours without major overhaul."

—N. L. Padgett, general superintendent
West Sand and Gravel Co., Richmond, Va.



N. L. Padgett, innovator of new and productive methods of handling sand and gravel.

When West Sand and Gravel acquired the site of its present operation, the output had been 35,000 tons of material a year. With N. L. Padgett as general superintendent, West is now producing 20 times as much material, with only three times as many men. Much of this increase can be credited to Mr. Padgett, who designed and supervised the manufacture of a new and more efficient washing and screening plant.

West operates 25 pieces of equipment using Phillips *66* products—cranes, bulldozers, front end loaders, pumps, road graders and trucks. Mr. Padgett says: "Our equipment works 24 hours a day in sand and water. We must provide the best protection possible. That's why we use Phillips *66* Heavy Duty Motor Oil, and other Phillips products. Some of our equipment has worked 18,000 hours without major overhaul, and one payloader worked 3,500 hours continuously without overhaul." In addition to Phillips *66* HD Motor Oil, West uses Phillips *66* gasoline, Diesel fuel and transmission and industrial greases.

Get the best long term performance out of your construction equipment. Depend on the outstanding products and service offered by your Phillips *66* Distributor.

Phillips 66

PHILLIPS PETROLEUM COMPANY

Call or write your nearest Phillips office

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USE PHILLIPS *66* HEAVY DUTY MOTOR OILS

HOW MUCH PROFIT IN THIS BUCKET?

Here's profit staring you right in the face . . . the heaped bucket of a Trojan tractor shovel . . . But it's the machine behind the bucket that *keeps* profits at their highest peak . . . All five Trojan models, from 18 cu. ft. to 4 cu. yds., are packed with a tremendous production potential, packed with longer working life and with features that keep maintenance at a bare minimum . . . Trojan operating features include low-load carrying position, reverse curve safety arms, straight line horizontal thrust, independent bucket action, non-stop shifting and Detroit Timken high traction differential and planetary axles . . . No other tractor shovel offers all these operating benefits, and that is why no other tractor shovel can match Trojan! For the name of nearest distributor, who will arrange a demonstration, in the Western area contact Dept. JB at San Leandro, Cal. In the East, contact Dept. RA at Batavia, N. Y.

Complete, detailed brochures are now available on the Trojan line. For your material write to Department B9, Contractors Machinery Div., The Yale & Towne Mfg. Co., Batavia, N. Y. or San Leandro, Cal.

TROJAN* *REG. U. S. PAT. OFF.

YALE & TOWNE

TRACTOR SHOVELS

2 & 4 Wheel Drive Front End Loaders

TROJAN DIVISION, THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK, SAN LEANDRO, CALIFORNIA

INDIAN
DRINKING WATER & SUPPLY TANK NO. 75G

Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5 gal. steel tank is curved to fit the back. Sturdy construction. Highly popular. Send for circular.

SMITH
Compressed Air
No. 22GO BANNER
SPRAYER
Capacity 4 Gals.

For spraying Silicon water repellents for masonry work and many other spraying purposes. Finest compressed air sprayer built. Send for catalog on complete line. Discounts in Quantity Lots.

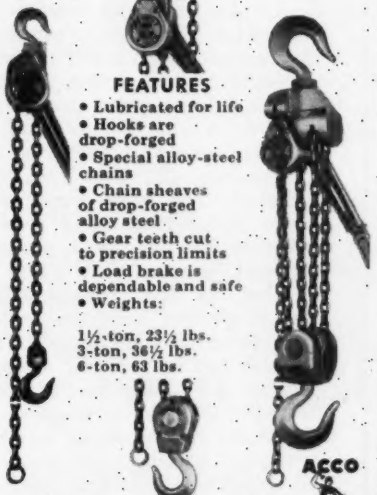
D. B. SMITH & COMPANY
"Choice for Quality the World Over"
450 Main St., Utica 2, New York

NEW WRIGHT
Type "C" Pull-A-Ways

THREE SIZES 1½, 3 and 6 Tons

FEATURES
- Lubricated for life
- Hooks are drop-forged
- Special alloy-steel chains
- Chain sheaves of drop-forged alloy steel
- Gear teeth cut to precision limits
- Load brake is dependable and safe
- Weights:

1½-ton, 23½ lbs.
3-ton, 36½ lbs.
6-ton, 63 lbs.

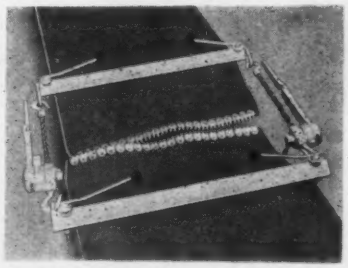


ACCO

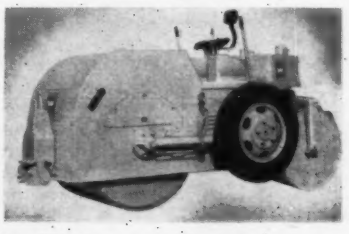
Write to York, Pa., office for complete information

Wright Hoist Division
AMERICAN CHAIN & CABLE
York, Pa., Bridgeport, Conn.

Its hardness ranges from Rockwell C 32-45 up to Rockwell C 56 after it work-hardens. The material can be heat-treated, air-hardened, and forged. It is capable of withstanding up to 375-amps at 32 v for a ¼-in. rod.—**Marquette Mfg. Co., 307 E. Hennepin Ave., Minneapolis 14, Minn.**



JOINS BELTS — Flexible Steel Lacing Co.'s new LS-3 Far-Pul belt clamp is especially designed for pulling together long, high-tension conveyor belt sections. The clamp consists of two pairs of clamping bars, one pair for each belt end. Each pair of bars is made up of three parts: an angle iron V-bar, a round gripping bar, and a draw-up bolt. To operate, V-bars are placed on top of the belt and back from the belt end. Round gripping bars, which are grooved to hold the belt securely, are positioned on the underside of the belt directly below the V-bars. Threaded holes at the ends of the gripping rods and V-bars are aligned, and draw-up bols are inserted and turned until the belt is locked between the V-bars and the rod. Standard "come-along" tools are used to draw the belt ends together.—**Flexible Steel Lacing Co., 4699 Lexington St., Chicago 44, Ill.**



TRAVELS WELL—A 4-6-ton roller with retractable travel wheels is the latest addition to Huber-Warco's tandem line. Retractable wheels, as well as the towing hitch, are operated hydraulically. Three steps prepare the roller for travel. First, the

LUBRIPLATE
No. 630-2
Multi-Purpose Grease

ALSO PACKED IN
CONVENIENT GREASE GUN CARTRIDGES

Lubriplate No. 630-2 is a high temperature, extreme pressure, water-repellent, grease type lubricant. Ideal for the general lubrication of Industrial, Automotive, Construction, Farm and Marine Equipment. Lubriplate Grease Gun Cartridges provide an easy, quick, economical means of application. Prevent the waste and mess of hand filling. Packed 10 Cartridges in a handy carrying carton.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

Onan ELECTRIC PLANTS

ELECTRIC PLANT NEWS

Onan ELECTRIC PLANTS

3,000 watts

New Onan all-purpose Diesel plant cuts electric power costs in half!

Lower fuel cost, less maintenance, and longer life cut power generation costs with the Onan 3DSL to half that of small gasoline-powered electric plants. For applications requiring an almost continuous supply of electric power, this new plant gives dependable service *season after season.*

Lighter weight and Vacu-Flo cooling

The new 3DSL is powered by an Onan single-cylinder, air-cooled full-Diesel engine. Available in all standard A.C. voltages and also as a 32-volt battery charger. Vacu-Flo cooling, permitting enclosed installations, is standard. It has a new mounted muffler, more efficient dry-type air filter, new geared crank, and it's hooded for protection on the job. Smoother-running, lighter weight, and compact.

New low price makes it an even bigger value . . . allows you to "go Diesel" for more of your power generation needs. For jobs requiring more capacity ask your distributor about the Onan 5DRP, two-cylinder, air-cooled, 5,000-watt Diesel.

Onan gasoline-powered plants: Air-cooled — 500 to 10,000 watts A.C. Water-cooled — 10 to 150 KW.

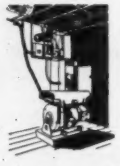
Handier . . . for more jobs!

Take it anywhere

Weighs only 470 pounds Haul it to the job in pick-up truck or on Onan's high speed, fully-enclosed trailer.

Operate it anywhere

New steel turret hood protects plant against weather and abuse on the job. All-climate insulated generator.



Install it anywhere

Vacu-Flo cooling permits enclosing the 3DSL completely. Automatically ventilates compartment.

Call your Onan distributor or write for information

D. W. ONAN & SONS INC.

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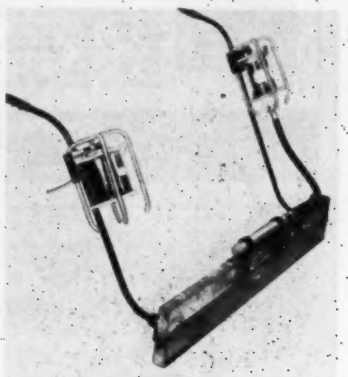
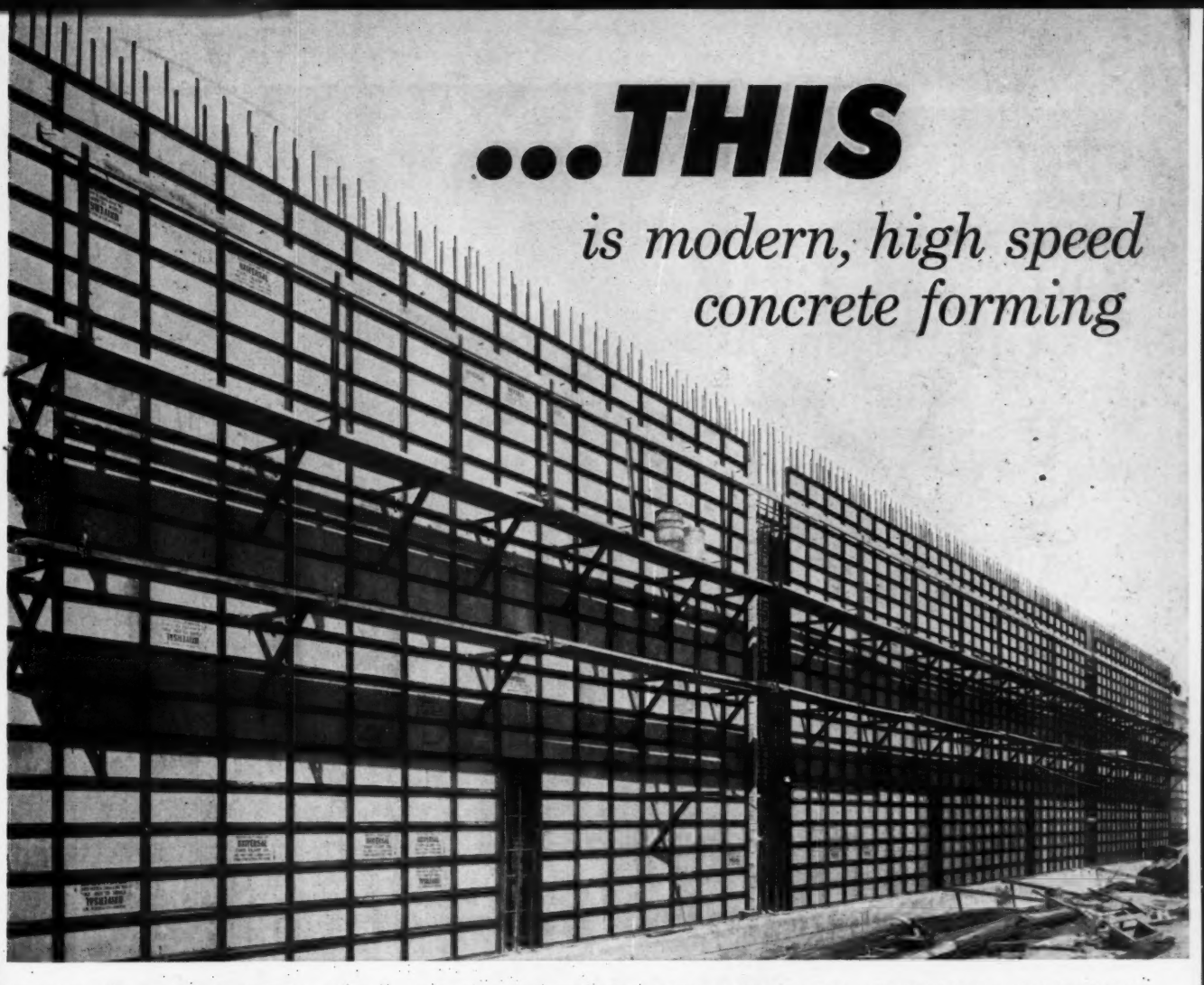
Onan ELECTRIC PLANTS

towing hitch lock pin is removed and the hitch is placed over the pintle hook of the towing vehicle. Next, the hydraulic control on the side of the machine is activated to lower the wheels and to raise the guide roll end of the roller. Finally, a second hydraulic lever on the side of the roller is activated to raise the drive roll end of the machine. The towing hitch lock pin is replaced and the machine is ready to move to a new job. Other features of the 4-6-ton tandem include a tail-shaft governor combined with a torque converter and water-cooled engine; a foot-operated disc-type brake located on the transmission output shaft; a variable speed steering valve; an easily removable kingpin housing; and a 34-in.-wide guide roll. — **Huber-Warco Co., Marion, Ohio.**



SCREED KIT — Wyzenbeek & Staff's new screed kit consists of a standard Wyco Junior vibrator that is attached to a 2x6 or 2x8-in. plank by two simple clamps. The screed is moved over concrete by means of two handles that are cushined in rubber sockets to keep vibration from the operators. The Wyco Junior vibrator motor is attached to one of the handles by a simple pin device and the speed control unit is attached to the other handle. Guards protect both the motor and the speed control unit. The vibrator can be used for screeds as short as 5 ft or as long as 20 ft. The vibrator head is designed so that it can run out of the mix for prolonged periods without overheating. The vibrator can be removed from the screed quickly and used in the regular way. A typical application of the unit would be for prestressed mem-



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is modern, high speed concrete forming

THIS IS UNI-FORMING... THE FASTEST GROUND-TO-GROUND SYSTEM

of concrete forming capable of handling virtually any type of poured concrete structure. UNI-FORMING is faster because assembly of UNI-FORM Panels with UNI-FORM Ties and Tie Keys is a simple mechanical (and automatically accurate) process . . . faster because minimum alignment and bracing is required on 1 side only . . . faster because every forming requirement is engineered into the system. In addition to its speed you'll find that the UNI-FORM System of concrete forming has many other advantages you can use to save time, money and labor.

UNI-FORMING HAS 3 BASIC ELEMENTS

1.

The UNI-FORM Panel is plywood faced, steel framed to provide strength and rigidity plus all the advantages of a nailing surface. Made in standard heights from 1 ft. to 8 ft.; widths 2 ft., 18".

2.

UNI-FORM Ties lock and spread UNI-FORM Panels. Made for all wall sizes. Special ties available.

3.

UNI-FORM Tie Keys securely lock Panels and Ties together.

Want more information on the UNI-FORM System? Write for new full line catalog today.

UNIVERSAL FORM CLAMP CO.

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Universal Form Clamp Co. of Canada, Ltd., 226 Norseman St., Toronto, Ontario

Bethlehem Rock Bolts are easy to install. Here slotted bolt, with wedge started in slot, is inserted in hole.

Rock bolts promote safety by stabilizing slopes

When bolt is driven with percussion tool, wedge is driven deep into slot, spreading bolt ends. Nut is then tightened with impact wrench.

Bethlehem Rock Bolts greatly reduce the chances of severe rock slides by locking together the stratified rock slabs, so that slopes are effectively stabilized.

TWO TYPES OF BOLTS The Bethlehem Slotted Rock Bolt, shown in the accompanying pictures, is inserted wedge-first in a drilled hole. The steel wedge, already started in the forged, centered slot, spreads the bolt ends when forced against back of hole. In addition to the 1-in. diam slotted bolt, Bethlehem also makes $\frac{5}{8}$-in. and $\frac{3}{4}$-in. diam Headed Rock Bolts, used with an expansion shell. Either bolt can be furnished in various lengths.

ROCK STRATA LOCKED TOGETHER Bethlehem Rock Bolts can be used with steel ties, anchor plate washers, or angle washers. Properly installed, the bolts provide a practical and economical means of locking stratified rock slabs together.

If you want to stabilize a troublesome rock formation, be sure to get in touch with us. All you need do is contact the nearest Bethlehem sales office.

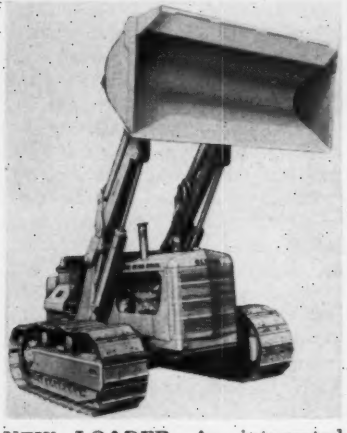
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

ber fabrication. The vibrator can be used when pouring the member, and then it can be set up on the screed to strike-off the pour. **Wyzenbeek & Staff, Inc., 223 N. California Ave., Chicago 12, Ill.**



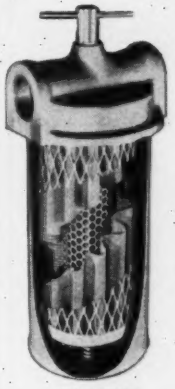
NEW LOADER—An integrated tractor shovel with a 2¼-yd bucket—the OC-156—has been added to the Oliver line. The loader is rigidly mounted so that loads are taken directly on the subframe. The new low-profile design also increases visibility and provides a lower center of gravity. An important feature is the fully protected design of the loader. The hydraulic pump is located under the radiator, and there are no hose connections to come loose. Full-length steel guards protect the six lower track wheels. Length of track on ground is 87⅛-in. and ground contact area is 2,788 sq in. The tractor is powered by a 110-hp engine.—**Oliver Corp., Industrial Div., 19,300 Euclid Ave., Cleveland 17, Ohio.**

DRILLS HARD ROCK—The new Schramm Rotatool does its work at the bottom of the hole—a feature that enables it to drill economically in hard rock formations that might stop ordinary rotaries.

continued on page 190

MARVEL Synclinal FILTERS

FOR DEPENDABLE PROTECTION
on Construction Industry's
Hydraulic Equipment



LINE TYPE
(Cutaway)

SUMP TYPE
(Cutaway)

Hydraulic Oils
MUST BE CLEAN

To Protect Equipment —
Increase Production —
Reduce Maintenance —

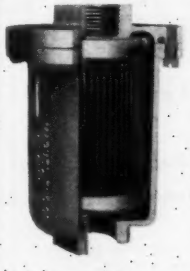
CONSTRUCTION ENGINEERS and MAINTENANCE MEN, whose job it is to keep machinery operating at peak efficiency, are specifying Marvel Synclinal Filters on new equipment and standardizing with MARVEL's on existing equipment.

OVER 800 Original Equipment Manufacturers install MARVEL SYNCLINAL FILTERS as standard equipment for dependable protection on all hydraulic and other low pressure circulating systems.

MEET J. I. C. STANDARDS

EASY TO CLEAN

Both sump and line types are easily disassembled, thoroughly cleaned and reassembled, on the spot, in a matter of minutes. Line type operated in any position and may be serviced without disturbing pipe connections.



IN-LINE FILTER

Handles up to 25 G.P.M. of hydraulic oil at very low pressure drop. Monel wire cloth filtering media is available in mesh sizes from 30 to 100. Cartridge is easily removed for cleaning.

A SIZE FOR EVERY NEED

Sump or line type filters in capacities from 5 to 100 G.P.M. Greater capacities attained by multiple installation. Monel mesh sizes from 30 to 200.

IMMEDIATE DELIVERY

For further information write, wire, phone or use coupon below

Catalogs containing complete data available on request

MARVEL ENGINEERING COMPANY
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Phone: JUNIPER 8-6023

Without obligation, please send me complete data on Marvel Synclinical Filters, as follows—

- ☐ Catalog #100—For Hydraulic Oils, Coolants, Lubricants.
- ☐ Catalog #200—For Fire-resistant Hydraulic Fluids (Aqueous Base)
- ☐ Catalog #400—For Fire-resistant Hydraulic Fluids (Synthetic)
- ☐ Catalog #301—For Water

CME-9

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Company .....
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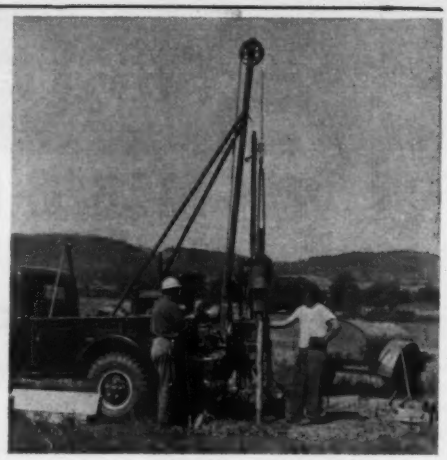
City .....
State .....

DEPENDABLE SOIL SAMPLING EQUIPMENT IS NO PROBLEM FOR THIS DRILL CREW



With a contract to obtain representative samples of the soil strata along the center line of an important link on the new Interstate Highway System, this contractor is using the S&H Split Barrel Sampler for recovering samples in this immediate area. At the next location, sampling for a bridge foundation, the S&H Shelby Tube Sampler will be utilized to recover the undisturbed samples that are necessary.

Sprague & Henwood's sampling equipment is designed for long, dependable service with a resulting minimum cost. The complete line of sampling devices and equipment is described in the new Bulletin 300.

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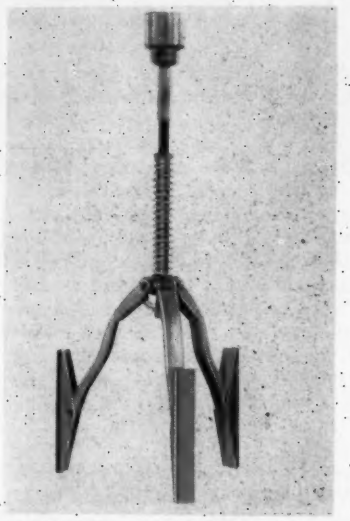
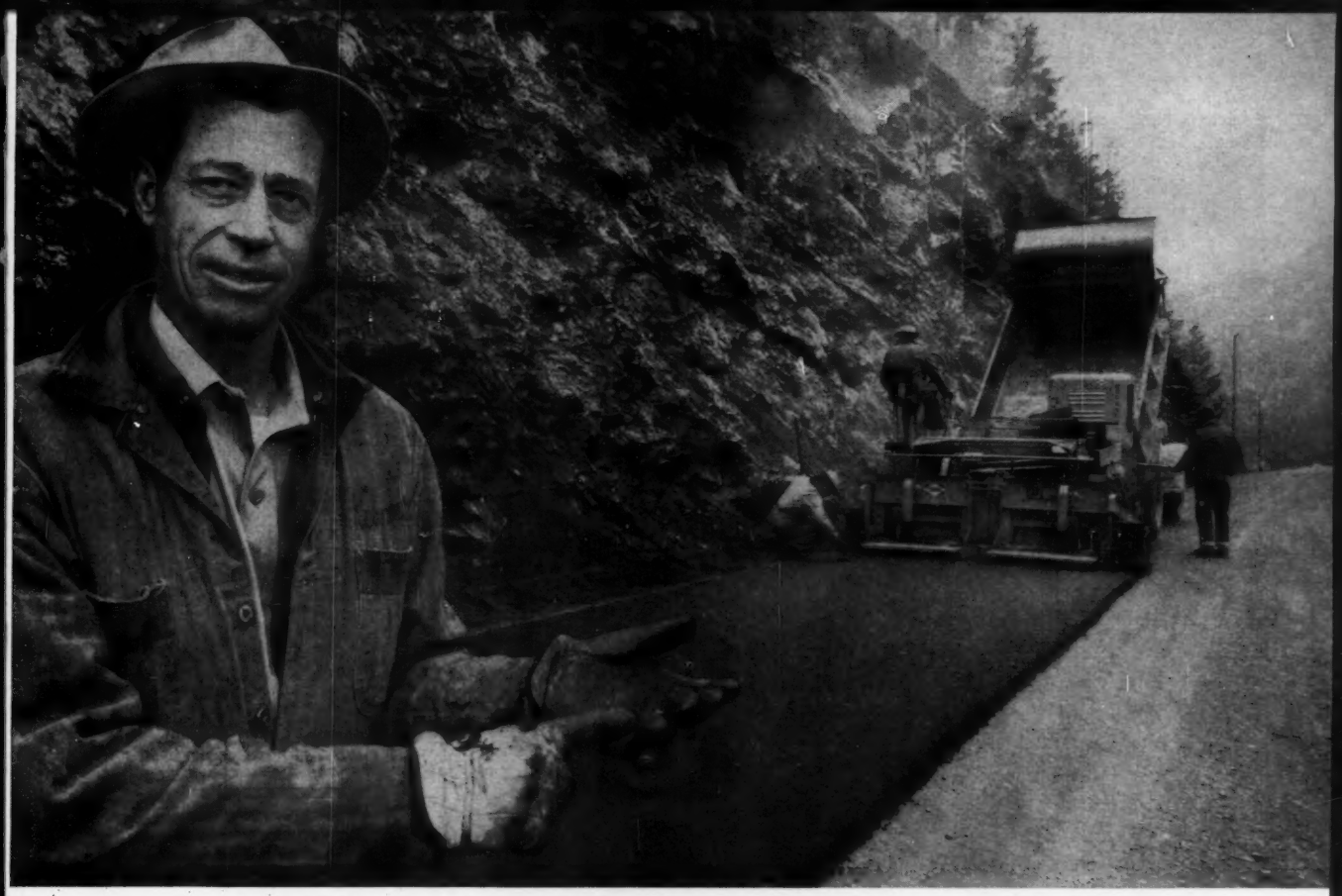
EQUIPMENT NEWS... continued

The new percussion tool, developed for use with Schramm Rotadrills, has a heavy hammer that produces good fracturing action for fast penetration. Since the percussive action is contained completely within the tool, no power is lost through the drill pipe. Unrestricted air passages in the tool permit the full available air capacity to pass through the bit to clear the hole of cuttings or water. The entire unit has only three moving parts. A special bit equipped with six carbide tips can be reground for repeated use. The Rotatool is available in two models. No. 3875 takes a 4½-in. bit and requires 100 cfm of air at 100 psi. The larger size, No. 5250, takes a 6-in. bit and requires 350 cfm at 100 psi.—**Schramm, Inc., 900 E. Virginia Ave., West Chester, Penn.**



CYLINDER CLEANER—A new self-adjusting hone for deglazing cylinders up to 7 in. in dia is revolved by a ¼-in. or larger drill chuck. The tool has three swivel-mounted heads. Two of the heads have either 220 or 400-grit abrasive cutting stones, and the other shoe is fitted with a felt wiper. The wiper carries oil to the cylinder bore and clears cuttings away from the abrasive stones. The shoes are connected to a flexible joint in the drive shaft. This design makes the tool self-centering, and it also allows it to be used in cramped engine compartments. The hone is priced at $11.95.—**Clark Feather Mfg. Co., Fort Morgan, Colo.**

continued on page 193



Mr. Randall Kilmer uses the Blaw-Knox Black Top Paver on the Elwha River Road west of Port Angeles. He values the locking differential that keeps the Black Top Paver going under all kinds of traction conditions.

"A REMARKABLE PAVER"

"It's maneuverability has already saved us the cost of an additional machine for dual lane paving. We've used the Blaw-Knox Black Top Paver just about everywhere—parking lots—widening and relocating—section repairing. Transportation costs for an ordinary paver would have made it unprofitable for us to bid jobs like these," reports Randall Kilmer, owner of the Kilmer Construction Company, Port Angeles, Washington.

"We have been able to bid on a wider variety of work and the quality of the mat layed by this machine is first and foremost with us. A State Highway Department Engineer rates it as one of the best he's ever seen," Mr. Kilmer reports.

Downtime on Mr. Kilmer's Blaw-Knox Black Top Paver has been limited to one on-the-spot fifteen minute repair job in a year. Routine greasing takes approximately thirty minutes per day.

Profitable, trouble-free performance like this has made the Blaw-Knox Black Top Paver a real money maker for contractors all over America. Why not get the full story from your Blaw-Knox distributor —you'll be surprised at how quickly you'll start earning additional profits.

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Construction Equipment
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Pittsburgh 22, Pennsylvania

Lima Austin-Western Model 101-S Plant, owned by C. W. Allen, Wilburton, Okla., producing gravel filter for Table Rock Dam on White River.

LIMA Austin-Western 101-S Plant Speeds Dam Project in Missouri

This high-capacity Model 101-S Plant is being used to produce gravel filter for the slope of Table Rock Dam, on White River, near Branson, Mo. Using riverbed gravel, the plant turns out an average of 100 cu. yds. per hr. of material ranging in size from 3 in. down to fine sand.

This portable crushing and screening plant sets a new high standard for high production and low maintenance. While intended primarily for gravel operation, it performs equally well in quarry service when combined with a portable primary. Standard equipment includes a 10 x 36-in. primary jaw crusher, a 30 x 20-in. roll crusher, 30-in. conveyors, and a 4 x 12-ft. inclined, positive-throw type vibrating screen. It may be had with either a shovel-loading hopper or a swivel drive for feed conveyor. It is a completely self-contained unit that can be transported over most highways without special permit.

Make your next crushing and screening plant a Lima Austin-Western for all-around economy and greater returns on the investment. Call on your nearest distributor for full information. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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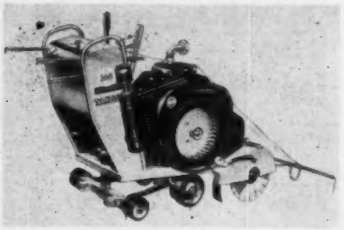

ADJUSTABLE SAW—The Target 368 self-propelled concrete saw features fast adjustment of the blade sawing line to meet variations in the hardness of aggregate; cutting differences in blades; for sawing on curves or slopes; or to satisfy operator preference. The 36-hp saw is equipped with a new speed control mechanism that enables the operator to change cutting speed from 1 to 25 fpm while the saw is in motion. A hydraulic Blade Touch control pumps the blade into the cut and bleeds it out in a single, swift movement. Rear and front roller wheels are all inside the cutting line of the blade so that the unit can be used near curbs, walls, or bridge abutments. Drive belts can be changed or adjusted without dropping the blade shaft assembly. The wheel distribution design enables the operator to tilt the saw forward on its front wheels when maneuvering. The operator has an unobstructed view of his cutting line and pointer at all times.—**Robert G. Evans Co., 6025 Troost Ave., Kansas City, Mo.**

MORE TRACTION—A new off-the-road truck tire—squared-off and widened in the shoulder area to give more traction—has been introduced by Goodyear. Called the Super Hard Rock Lug, the tire is available in all wide-base sizes

inspection...

is this your wire rope problem?

Safety and economy can be greatly improved by methods described in LESCHEN RED-STRAND BULLETIN NO. 104

Without adequate inspection, a severely damaged rope might remain in service until sudden failure and thus bring disaster. Such danger will be foreseen and adequate safety measures adopted in plenty of time, however, wherever a well organized program of periodical inspections is maintained. Bulletin No. 104 gives detailed instructions for setting up and maintaining such a program, tells what to look for and what findings mean. Copies sent free on request. Write to H. K. Porter Company, Inc., Leschen Wire Rope Division, St. Louis 12, Mo.

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LESCHEN WIRE ROPE DIVISION

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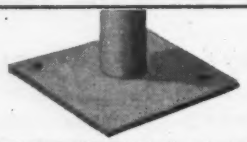

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in tubeless or tube-type versions. It is built from cut-resistant rubber compounds and Goodyear's triple-tempered nylon cord. Because extra rubber has been added to the deepened and widened shoulder area, the tire has more of a working footprint in ground contact. This provides a stronger bite and cuts wear because the tire resists shoulder snags and cuts. The tire is available in sizes ranging from 23.5 with 12, 16, or 20-ply ratings; 26.5 with 20 or 26-ply ratings; 29.5-29, 22, 28, and 34-ply ratings; and 33.5-33 with 26, 32, or 38-ply ratings.—**Goodyear Tire & Rubber Co., Akron 16, Ohio.**

CLEAN WATER—A new portable, stainless steel water container for field use holds up to 4 gal of pure, clean, drinking water that is available at the touch of a button. Pressure is built up by a few strokes on a built-in pump. The stainless steel inner tank is fully insulated. It will maintain water temperature to within 10 deg for 12 hr in the hottest weather, according to the manufacturer. The tank has an extra larger opening at top for cleaning or for adding ice to the water. The outer jacket is a tough, galvanized steel cover.—**Industrial Products Co., 2715 N. 4th St., Philadelphia 33, Penn.**

HYDRAULICALLY ADJUSTABLE—Pioneer's new 4030 twin roll crusher features a hydraulic adjustment for crusher settings that enables quicker changes to meet the needs of different material sizes. Available with two

British Engineering Company Seeks License to Manufacture American Road-laying Machine Or Equipment Allied to Road Building

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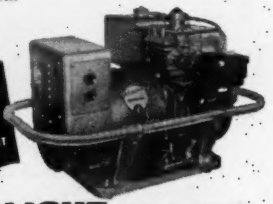
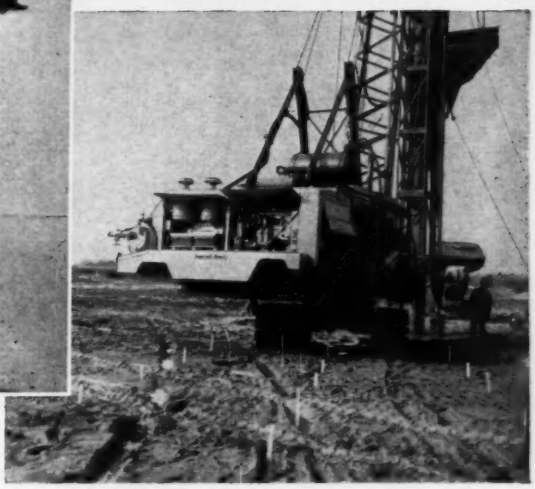


KATOLIGHT CORPORATION
BOX 89-106 MANKATO, MINNESOTA

GYRO-FLO *in the news*



Breaking old asphalt with an I-R PB8A paving breaker operating off a 125-cfm Gyro-Flo. This compressor will handle two such breakers.

Driving a special-type pile driver as sand casings are placed for a bridge approach, this big 900-cfm Gyro-Flo replaced two smaller compressors.

On a pole setting job in rocky soil a utility company uses the highly portable 85-cfm Gyro-Flo and an Ingersoll-Rand PB6 paving breaker.

Emergency air power to a manufacturing plant is furnished by this 900-cfm Gyro-Flo, while the plant's stationary unit is being repaired.

Artifical snow system for the ski slope of an eastern state park is powered by these Ingersoll-Rand Gyro-Flo units . . . a 600-cfm and a 210-cfm.

A Gyro-Flo for every job...

the right compressor...from the most complete line of rotary portables available

To get maximum efficiency and economy on *any job* requiring air power, you need a compressor that's the right size for the tools you want to operate. With the Ingersoll-Rand line of rotary portables, you can match the compressor to the job . . . get full, efficient pressure at the tools, yet avoid excess horsepower and fuel costs. The I-R Gyro-Flo line is the world's most complete; six models, capacities of 85, 125, 210, 315, 600 and 900 cfm. Backed by a nation-wide service organization.

And regardless of which size you choose, your Gyro-Flo compressor will give you unmatched dependability and efficient performance on every kind of job. The exclusive Gyro-Flo rotary design, developed by Ingersoll-Rand, has been imitated but never equalled in overall economy of operation. Ask your I-R dealer or representative for details on the units best suited for your requirements.

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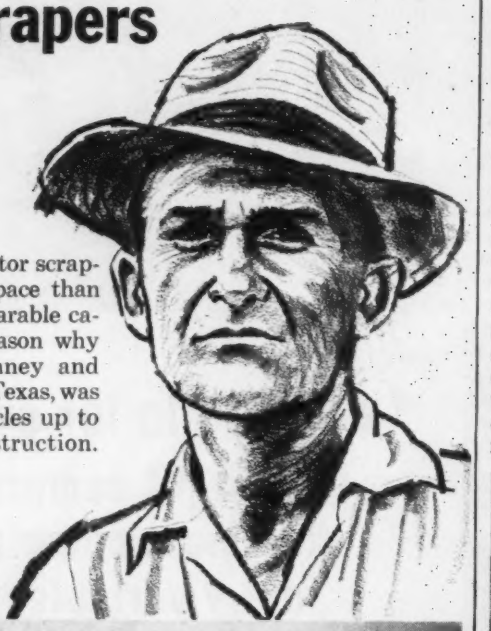
Cuts cycle time 41% on watershed dams with Allis-Chalmers motor scrapers



Allis-Chalmers TS-260 motor scrapers turn around in less space than any other scraper of comparable capacity. That's one big reason why G. V. Walker of McKinney and Wheelock Co., Corsicana, Texas, was able to reduce hauling cycles up to 41 percent on dam construction. Here are the facts—

G. V. Walker, Supt.
McKinney and Wheelock Co.

These Allis-Chalmers TS-260 motor scrapers save 42 miles of extra travel for McKinney and Wheelock Co. on a Texas earthfill dam because of their ability to make full turns after the dam became too narrow for other scrapers to turn on.

3 earthfill dams . . . 300,000 cu yd moved

Superintendent Walker reports a total of 300,000 cu yd of material moved on three recent Texas watershed dam jobs. On these operations there were three Allis-Chalmers TS-260 motor scrapers. The shorter turning radius of the TS-260's (full turns in 30 ft) allowed Walker to build the dams higher before the scrapers were forced to travel the full length of the dam to turn around.

Saves 42 miles of extra travel

On Project 26, for example, Walker's TS-260's were able to carry 162 more short-haul loads because they continued to make full turns after the dam became too narrow for other scrapers to turn. When the dam reached that critical height, other scrapers required a total haul-return distance of 550,800 ft. The distance traveled by the TS-260's totaled only 324,000 ft . . . saving 226,800 ft or 42 travel miles.

Loaded TS-260 powers its way upgrade to the rising dam.

Besides TS-260 turn-ability, Walker likes the positive, hydraulic, double-action bowl jacks that permit down pressure for fast penetration of hard material. The curved cutting edge breaks up sandy Texas clay, "boils" it into the bowl. Material loads easier and fills every corner for maximum yardage each trip. Positive forced ejection makes fast and accurate spreading.

All in all, G. V. Walker sees his Allis-Chalmers dirt-moving fleet as a real money-maker and work-saver. See for yourself by asking your Allis-Chalmers construction machinery dealer for an on-the-job demonstration. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

smooth rolls that will take feed up to 4 in., the crusher is well suited for final-stage crushing when controlled gradation and little recirculation of oversize material is required, according to the manufacturer. Power required ranges from 135 to 160 hp, depending on the size and toughness of material. Like other Pioneer crushers, the new unit retains the star gear drive between rolls. The crusher, which weighs 37,000 lb, is 5½ ft high and 14 ft long. Overall width is 8½ to 9½ ft, depending on the type of drive shaft.—**Pioneer Engineering, Div. of Poor & Co., Inc., 3200 Como Ave., Minneapolis, Minn.**

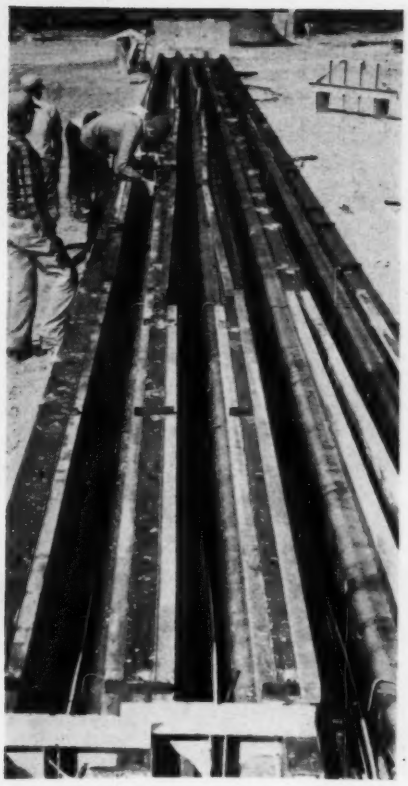
CLEANS SMALL PARTS—The Magnus Miji Lif cleaning machine removes grease, oils, dirt, and carbon deposits from small engine parts. Two sizes are available, one with a 21x18x12-in. high working space and a load capacity of 75 lb; and another with a 29x18x12-in. high working surface with a load capacity of 100 lb. The operation of both machines is controlled by a single lever that raises the work platform to the top of the machine for loading, inspection, or unloading. The same lever lowers the platform into the cleaning solution. In the solution, parts are automatically agitated up and down. The agitating device is powered from a compressed air line. Both models are available with steel immersion heaters that are equipped with self-contained thermostats. —**Equipment Div., Magnus Chemical Co., Inc., South Ave., Garwood, N.J.**

Flexibility

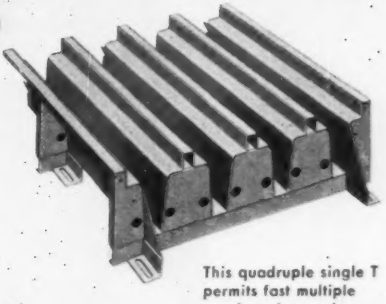
IS THE WORD FOR

FORM-CRETE

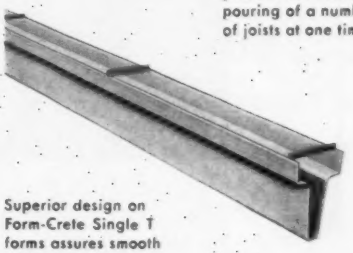
SINGLE T STEEL FORMS



Here is a form built for standard Single T castings, yet has plenty of flexibility to permit varying heights and widths. Each single T is die-formed from heavy gauge steel, insuring straight alignment, positive release of cast product and smooth, clean finish. Appropriate draft is provided to allow trouble-free stripping. In addition, filler channels are interchangeable with Form-Crete Double T units, materially reducing inventory requirements. An informative catalog containing details on Form-Crete Single T's and many other forms will be sent you by return mail. Send today for literature.



This quadruple single T permits fast multiple pouring of a number of joists at one time.



Superior design on Form-Crete Single T forms assures smooth edges and flawless exposed stem sections.

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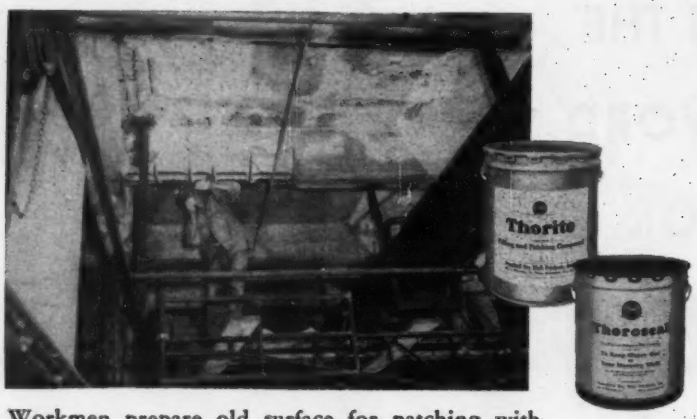
How THORITE and THOROSEAL made this underground structure sound again!



Workmen prepare old surface for patching with THORITE.

Water has entered the concrete and caused corrosion of reinforcing rods, blistering the concrete off surface and causing structural weakness throughout building.

Reinforcing was cleaned, all corrosion was removed and brush coat of THORITE applied over entire patching area, then filled in with trowel coats of THORITE, even with surrounding surfaces.

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New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

HIGHWAY DIRECTORY — The 1958 directory, "Highway Officials and Engineers" is now available. It includes more than 1,700 names of officials in all U. S. highway departments and toll road authorities. Also listed are administrative personnel of the Bureau of Public Roads and the ARBA organization. Price $1.—**American Road Builders' Association, World Center Building, Washington 6, D. C.**

CRANE STANDARDS — The Power Crane & Shovel Association, in cooperation with the U. S. Department of Commerce has completed a new commercial standard for power cranes and shovels. The standard, CS 90-58, is designed to establish uniform methods for specifying and describing these machines. Price 20¢.—**Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.**

CONCRETE DATA—The American Concrete Institute has published a revised 72-p edition of its "Concrete Primer." It retains its pocket size as well as the question and answer form of the earlier edition. It includes sections on cement and concrete definitions and characteristics, factors affecting the strength of concrete, air entrainment, proportioning concrete, and the production of durable concrete structures. Since its first edition in 1928, over 85,000 copies of this book have been sold. Price $1.—**American Concrete Institute, P. O. Box 4754, Redford Station, Detroit 19, Mich.**

SAFETY BOOKLETS—The National Safety Council has issued two new publications. The 96-p, 1958 edition of "Accident Facts" is the Council's statistical yearbook. It lists accident rates by industry groups and describes the most common sources of work injuries, parts of the body most often injured and how unsafe acts and conditions contribute toward accidents. A pamphlet, "Don't be

A-W Tandem Roller compacting base for asphalt road at Dayton, Ohio. Owned by Earl D. Creager, Inc.

"Our A-W Tandem is doing an excellent job..."

—Earl D. Creager, Inc.

Earl D. Creager, Inc., is a general contracting firm in Dayton, Ohio, which does a considerable amount of road and highway construction work. The company owns about $1,000,000 worth of equipment, in 1956 grossed more than $3,000,000. In May 1957 it purchased a new A-W Tandem Roller.

Earl D. Creager, president, says: "We made our decision to buy an Austin-Western after looking the market over very carefully. Precision and dependability were our main concerns, and the A-W seemed to fill the bill best.

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A-W rollers are available in these models: tandem (5 to 14 tons), portable tandem (3½ to 6 tons) and 3-wheel (8 to 14 tons). Get all the facts from your nearby A-W distributor or write to us.

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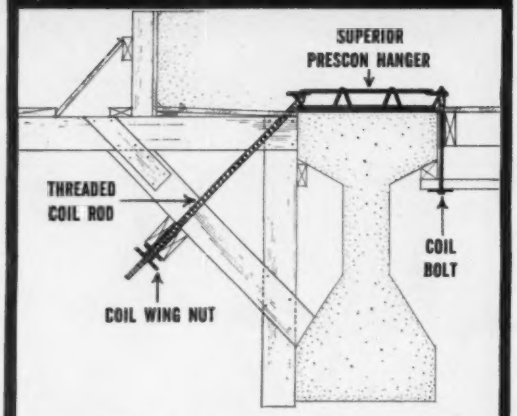

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NEW PUBLICATIONS ...
continued

Alarmed," gives the latest advice and information about fires. For further information and prices contact—**National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.**

TWO-WAY RADIO — Motorola has published a reference booklet on the entire field of two-way radio communication. While not specifically directed to construction uses, it does contain some useful background information for contractors, including how to acquire a radio system under FCC rules, and future trends for mobile radios.—**Motorola, Inc., Communications and Industrial Electronics Division, 4501 West Augusta Blvd., Chicago 51, Ill.**

FORM CATALOG — Williams 1958 catalog, entitled "Form Engineering" is now available. The 67-p booklet includes specifications for Williams form accessories and describes proven methods of concrete forming for light and heavy construction. A number of job pictures are included. —**Williams Form Engineering Corp., 1501 Madison Ave., S. E., Grand Rapids 7, Mich.**

COMPACTION METHODS—Bros Inc. has compiled a 51-p booklet of 10 articles on compaction. Each one is written by an expert on his subject and the titles cover a number of methods and equipment.—**Bros Inc., Road Machinery Division, 1057 Tenth Ave., S. E., Minneapolis 14, Minn.**

WIRE ROPE—Union Wire Rope Corp. has published three new booklets. Form 2270 is a 38-p handbook on splicing techniques. Form SL-3 is a 40-p catalog on Tuffy slings and fittings, including types, dimensions, and rated loads. A 12-p booklet, entitled "Wire Rope Lubrication," recommends the proper lubricant for different types of wire rope and how to apply it.—**Union Wire Rope Corp., 2100 Manchester Ave., Kansas City 26, Mo.**

CONCRETE SLIDE RULE — A free slide-rule type cost calculator shows how much concrete can be moved per man hour for various pour distances. On the other side it shows the cost per yard for placing concrete under vari-

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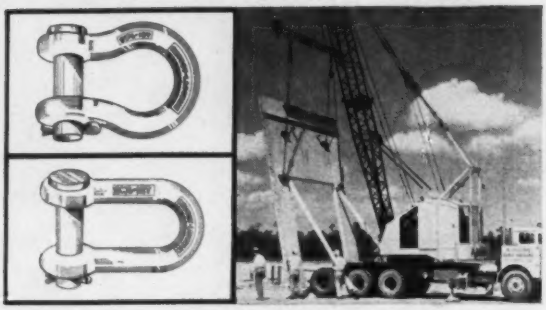

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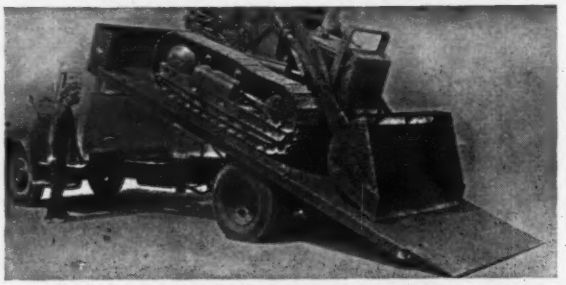

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NEW PUBLICATIONS...
continued

ous conditions. The device is designed primarily to compare the Prime-Mover M15A with hand methods, but it also provides a fast way to estimate costs and quantities under average conditions.—**The Prime-Mover Co., Muscatine, Iowa.**

BITUMINOUS PLANT—An 8-p folder describes Pioneer's new "Auto-batch" bituminous plant. Two cutaway views show operation of the plant. Complete specifications are included for comparison with other types of plant. Pioneer says this plant can produce 15% more mixed material than conventional plants of the same rating.—**Pioneer Engineering Division, Poor & Company, 3200 Como Ave., Southeast, Minneapolis 14, Minn.**

CONCRETE ACCESSORIES — A 6-p folder by Superior has been specially prepared to describe accessories for concrete bridges and structures in highway construction. Included are form ties, deck hangers, screed supports, and forming accessories. — **Superior Concrete Accessories, Inc., 9301 King St., Franklin Park, Ill.**

WET MIX GUN—An 8-p catalog describes the "Refract-All Gun" that can be used for pneumatic wet-mix application of refractories, insulations, cement-sand mortars, and emulsified asphalt-sand mixes.—**Refract-All Manufacturing Co., 3703 East 36th St., North, Tulsa, Okla.**

TESTING EQUIPMENT—Testlab has issued a complete 128-p catalog describing their line of testing apparatus and laboratory supplies for soils, concrete, asphalt, highway work, and foundations. Separate price lists are available. —**Testlab Corp., 2734 North Laramie, Chicago 39, Ill.**

RAMSET DATA—Ramset has prepared a booklet showing how their powder-actuated tools can be used in highway construction. It suggests such jobs as fastening concrete forms on bridges, fastening conduit, concrete ties, drainage pipes and gutters.—**Ramset Fastening System, Department B-126, Olin Mathieson Chemical Corp., 12117 Berea Road, Cleveland 11, Ohio.**

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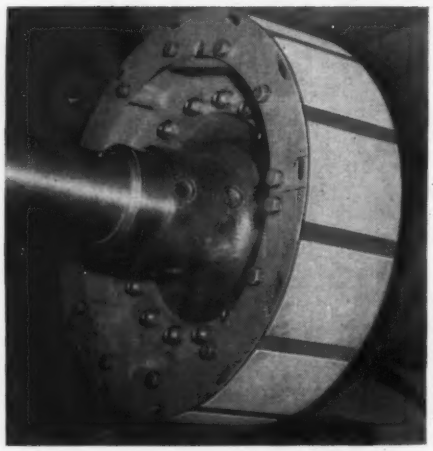

Full circle stopping power of B. F. Goodrich Hi-Torque Brake allows safe hauling in higher gear — because it stops heavy equipment twice as fast as conventional shoe brakes.

CIRCLEVILLE, OHIO — After months of actual operating experience with the new B. F. Goodrich Hi-Torque Brake, C. F. Replogle Company reports "a definite cycle time reduction". Replogle, prominent contracting firm in Ohio and surrounding states, attributes this reduction entirely to the new brake "which allows safe hauling in higher gear".

With the new brakes installed for comparison tests on tractor-scraper combinations and heavy dump trucks, Replogle discovered many other advantages over conventional two-shoe brakes. For instance, maintenance down-time is reduced considerably, since the brakes are self-adjusting throughout the life of the lining. Job capabilities are expanded because the brakes give smoother, faster stops with less chance of fade—enable Replogle to run on terrain operators considered unsafe using conventional brakes.

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B.F.Goodrich Hi-Torque brakes

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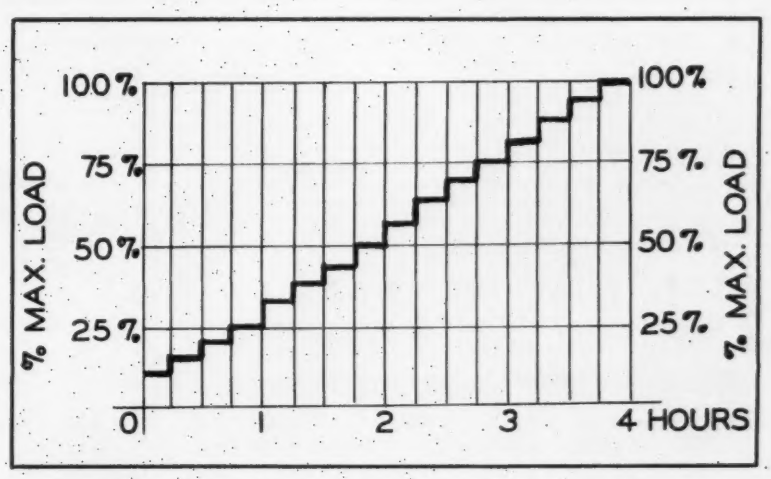

CRITICAL PERIOD—First 4 hr after a reconditioned engine is put back into service are critical. Chart shows how engine load should be stepped up in 15-min stages.

MONEY SPENT for labor and parts to recondition a high-speed engine usually pays off in many hours of trouble-free service—but only when the reconditioned engine goes through a proper break-in period before it is asked to operate at top speed under a full load.

A reconditioned engine generally will have new main and rod bearing shells, pistons, rings, and cylinder liners as well as other new parts. Unless these parts seat themselves properly during the break-in period, you defeat the purpose for which the engine was overhauled in the first place. When new rings fail to seat properly, for example, compression is lower than normal, and oil consumption rises.

The best way to break in a reconditioned engine is to operate it for several hours in a dynamometer test stand, according to W. J. Byers, assistant service manager of Allis-Chalmers' Construction Machinery Division. The main advantage of a dynamometer run-in is that it provides accurate control of engine rpm, load, and temperature.

The first hour a reconditioned engine operates is the critical one. As the chart shows, run the engine at only 10% of its rated horsepower for the first 15 min; at 20% of its rated horsepower for the next 15 min; and at 25% of its rated horsepower for the next 30 min.

For the next 3 hr, progressively increase the load on the engine every 15 min so that at the end of this period it will be producing its rated horsepower at rated speed.

During the last 15 min of the run-in period, when the engine is operating at its full rated load, check it carefully. Make sure that oil pressure and engine temperature are within the recommended range and keep a record of these gage readings for later comparison. Intake manifold pressure, exhaust manifold pressure, and exhaust temperature are three other important readings that should be recorded even though the engine may have attained its rated horsepower in the final stage of the run-in period.

This is also the time to see that cylinder head bolts or nuts are torqued to specifications and to check valve lash and clearances. Chances are that valves will have to be readjusted after the initial run-in period.

The dynamometer run-in period is not the last step before the engine is ready to be returned to normal service. After the engine has been reinstalled in its rig, operate it for several hours as you would a brand new engine. Check the manufacturer's recommendations for breaking in a new engine. Let the machine work up to heavy-duty, full-load service gradually.

Before returning a reconditioned engine to normal service, change the engine oil and oil filter elements. The mild detergent type of engine oil that is recommended for use during the break-in period generally will become contaminated before its time as the new engine components seat themselves. Replace this oil with the grade and type recommended for normal service.

Every shop that is equipped to do major engine overhauls should have a dynamometer or run-in stand. If this type of equipment is not available, be careful not to over-load or over-speed an engine after it is returned to its rig. Run the engine for several hours with no load. After this period, check the engine and reset valves, tighten cylinder nuts, and make other necessary adjustments. Make these adjustments after the engine has had a chance to build up and maintain its normal operating temperature for 30 to 45 min.

Be sure that the cooling system has been cleaned, and see that the water pump and thermostats are working properly. Then run the engine under a gradually increasing load for the next few hours to give the new moving parts a chance to seat properly.

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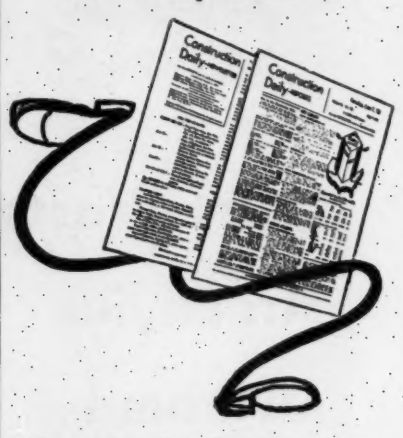

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Forging Ahead at Priest Rapids. This photograph shows construction work on the 1025-ft powerhouse at Priest Rapids Dam, a four-year building project that started in July, '56. Tremendous progress has already been made. Both the Public Utility District of Grant County, Wash., and the Northwest Power Pool can soon look forward to vast new supplies of electric power. Ten generators with a total rating of 788,500 kw will be installed in the powerhouse.

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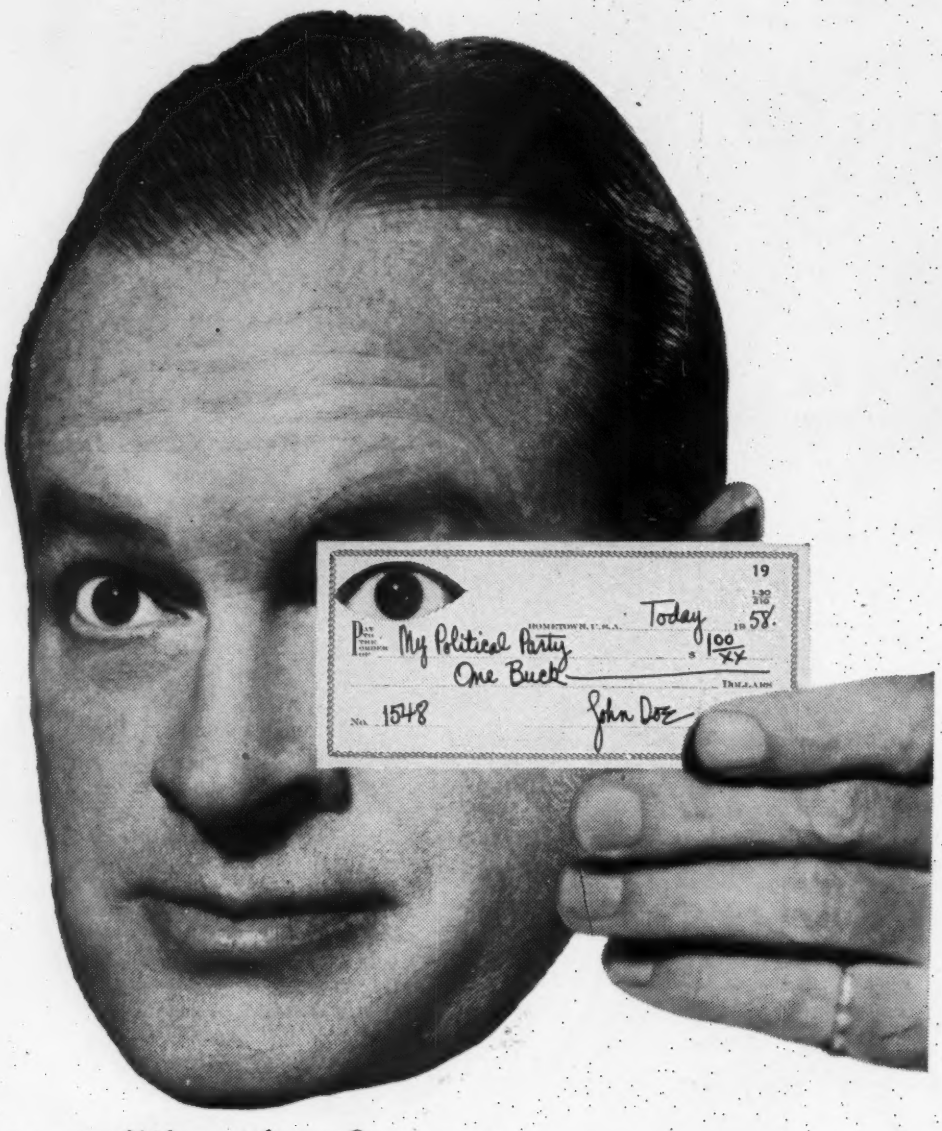

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Methods Memo . . .

Causeway Breaks Apart

There've been five slides in the fill placed by Morrison-Knudsen for a 13-mile causeway across Great Salt Lake in Utah. The first four were relatively minor, but the fifth broke out a 2,200-ft length of the causeway. About 2,000,000 cu yd of material slid down into the water.

It happened six days after the fill had been placed. The bottom at the point of the failure is a layer of salt about 10-ft thick but not as hard and strong as the salt layer under other sections of the fill.

Before construction started engineers made extensive soil investigations. About half of the causeway will be based on a salt layer; most of the other half will rest on a clay that compacts and gains strength under load.

Morrison-Knudsen will rebuild the slid section, placing new material from bottom-dump barges. M-K expects the repair work will not delay completion beyond the July 1, 1959, target date.

The $49-million job will require a total of about 31,500,000 cu yd of fill, making it one of the largest jobs of its type on record. The causeway will carry tracks of the Southern Pacific across the lake. It will be 35 ft wide at the top and about 450 ft wide at the base. Depth varies from 46 to 85 ft.

100-Yd Scrapers

This month R. G. LeTourneau will unveil a line of scrapers two and three times as big as the biggest at work today.

They are the first earthmovers manufactured by LeTourneau since he sold his earthmoving equipment business to Westinghouse Air Brake Co. in 1953.

The big rigs will be in the 70 and 125-ton class—roughly equivalent to 50 and 100-cu-yd capacity. The biggest scrapers available now have a capacity of 35 cu yd.

Each wheel of the new LeTourneau scraper will be driven by an individual electric motor powered from a 600-hp diesel-electric dynamo. Designers of the rig say this should provide greater traction and working power under payload.

One of the new 70-ton units will be on display at the American Mining Congress in San Francisco, Calif., September 22-25. An obvious application of the rigs would be in large-scale strip mining, but LeTourneau expects they also will play a significant role in highway and dam construction.

Russian Piledriver

The Russians say they have developed a new technique for driving hollow steel piles in deep water. A Moscow newspaper claims the method is faster and cheaper than conventional piledriving.

They put a turbodrill inside the hollow pile, then pump water through the pile to turn the drill. When the pile reaches required depth, the drill is pulled out and the pile filled with concrete.

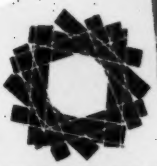
The newspaper report says Russian crews have tested and proved this new technique in offshore oilfields in the Caspian Sea.

PLAN '59 FOR WHAT'S AHEAD

The October issue of Construction Methods will explore the challenging future of the construction industry. This special report will present facts and figures to define the growing market for construction and help management plan now to meet the problems and take advantage of opportunities that lie ahead . . . *COMING IN OCTOBER.*

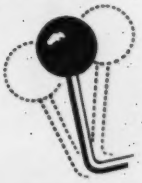
CONTRACTORS CUT COSTS WITH EIMCOS'

Move more earth at less cost with Eimco heavy-duty equipment



INDEPENDENT TRACK ASSEMBLY
Each track is powered and controlled separately — Tractor spin turns in it's own length, with one track in forward and the other in reverse.

UNIT ASSEMBLY
Each major tractor component is a separate assembly for easy maintenance or removal without disturbing other components.



INSTANT REVERSAL
No stopping, manual clutching or gear shifting to change directions — A pull on the track control levers immediately reverses the tractor.

FULL VISIBILITY
Up-front operators position eliminates all guess work in dozing, digging, pushing and loading operations.

Eimco heavy-duty earth moving machinery will permit lower bids on construction work.

Here are reports from a few jobs where Eimco equipment is being used:

1. Underground limestone quarry working an Eimco 105 on 2 levels to do all underground loading. — "Our maintenance parts and labor for the past 21 months have cost 2½ cents per ton."

2. Road contractors in the deep South — "We now have more than 17,000 hours on our 105 and have not had to open the transmission for any reason."

3. "We averaged better than 45 feet a day on our job mostly because of the 105's." — This letter from a tunnel contractor who is driving a large heading with two 105's working side by side.

4. Quarry contractor — "In a few days we should receive our third Eimco 105. These machines are gradually taking over all production and are replacing the boom shovel."

5. Railroad contractor — "Our 105 has replaced a 1½ yard boom shovel and a bulldozer we had used to move stone up to the shovel.

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P & H HARNISCHFEGER CORPORATION, MILWAUKEE, WISCONSIN...uses Timken tapered roller bearings for practically friction-free operation in its heavy-duty cranes.

MOST POWERFUL CRANE ON WHEELS LIFTS 45 TONS ON 37 TIMKEN® BEARINGS

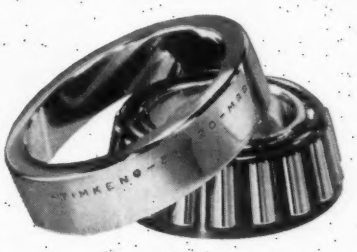
IMAGINE the fantastic strain when this Harnischfeger Corporation 575-TC truck crane lifts 45 tons on a 40-ft. boom. Or 10 tons on a 130-ft. boom (see picture at left). It's the world's most powerful truck crane—and a natural for Timken® tapered roller bearings. Harnischfeger engineers specified 37 Timken bearings at vital load-carrying spots in the boom hoist drum, digging drum, swing shaft, front and rear axles.

Timken bearings give extra load-carrying capacity because there's full line contact between rollers and races. And the tapered design lets Timken bearings take the tremendous radial and thrust loads in all combinations. To take shocks, Timken bearings are case-carburized to get hard, wear-resistant surfaces and tough, shock-resistant cores.

And with Timken bearings, shafts are held concentric with their housings, making closures more effective. Dirt and dust stay out, lubricant stays in. Timken bearings practically eliminate friction, give longer bearing life with less maintenance. And we even make our own steel . . . something no other American bearing manufacturer does.

Look for the "TIMKEN" trade-mark on every bearing when you build or buy machines. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



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